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PIT AND QUARRY

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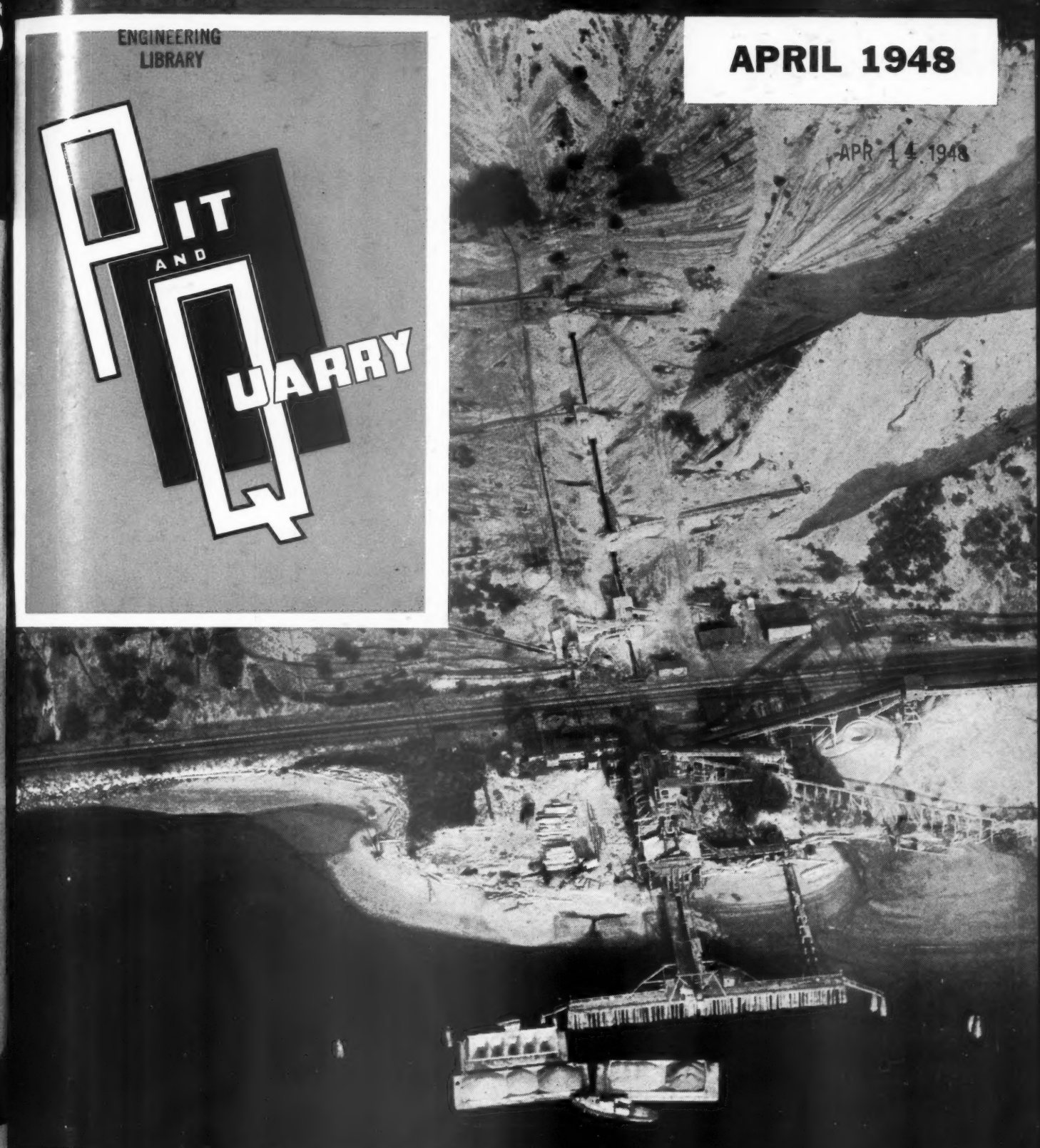

Deposit and Plant of the Glacier Sand and Gravel Co., Steilacoom, Wash.

In this Issue

Report on A. I. M. E. Convention • Metropolitan Sand & Gravel Company's New Distributing System • New Office And Laboratory Building of National Crushed Stone Assn.

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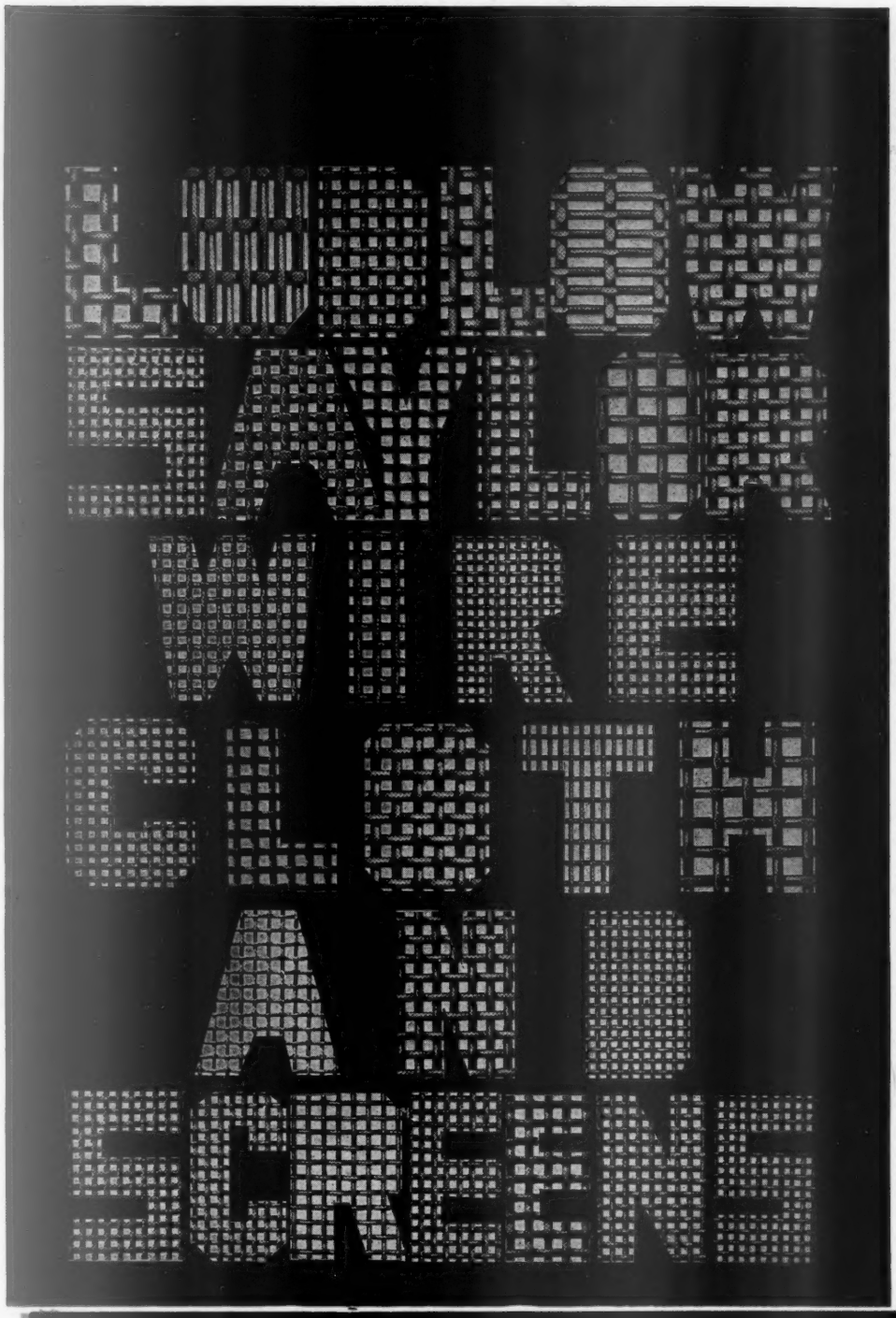

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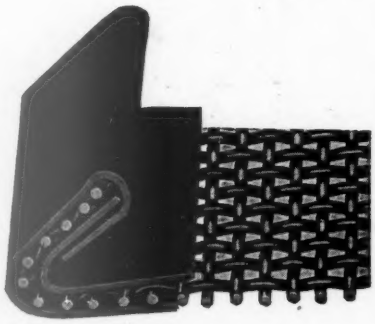

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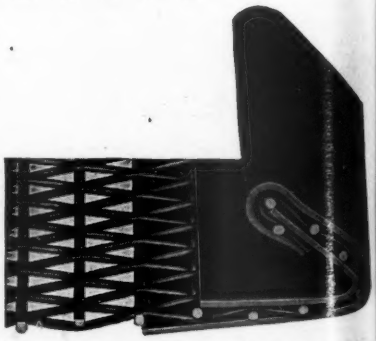
Order Ludlow-Saylor *Engineered* Hook-Strips for tensioning vibrator-screen decks. They transmit to every tensioned wire an equal share of uniform vibration, evenly distributed throughout the entire screen area. They make screen decks last longer — step-up screen capacities — are easier to handle—quicker to install—need fewer adjustments and renewals.



Through Better Use of Energy

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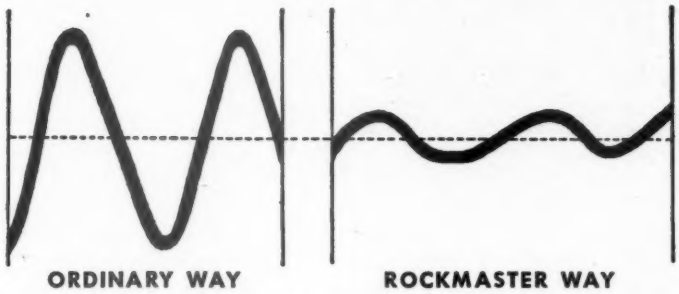
Stopped Objectionable Vibration on This Job



ORDINARY WAY | **ROCKMASTER WAY**

An 11 hole blast using 3300 lbs. of dynamite fired by ordinary methods produced this reading on a seismograph used to record the vibration.

This ROCKMASTER blast used 12 holes and 3575 lbs. of dynamite, yet the seismograph reading showed only one-third the amount of vibration.

The vibration record of two comparable blasts, one fired by the Rockmaster blasting system and one by ordinary methods, is shown above. It is easy to see how important this reduction in vibration is to quarries, construction jobs and coal stripping pits that operate near residential communities.

and ROCKMASTER cuts costs, too!

The Rockmaster system splits up a big blast into smaller ones, staggered milliseconds apart. That's how it controls vibration. And that's why it also achieves these other important money-saving results!

1. ***More rock ready for the shovel.***
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4. ***Wider spacing of drill holes*** can frequently be used, saving drilling costs and explosives costs.
5. ***Better control of "throw."***

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PIT AND QUARRY

APRIL 1948
Vol. 40 No. 10

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PIT AND QUARRY IS INDEXED IN THE ENGINEERING INDEX

To subscribers: Date on lower right-hand corner of envelope indicates issue with which your subscription expires. In writing to have address changed, give old as well as new address.

NOTE:
To compensate for the five-eighths-inch crown of the original pulley, one inch of metal was left in the center of the motor pulley as can be seen in this photograph.

POWER PLANT EXPENSE REDUCED OVER $3,000 ANNUALLY

Boilers and machinery in the power plant of a large Central Ohio clay products manufacturer were badly in need of repairs. To replace worn-out equipment called for large capital expenditures and even with new equipment, estimated operating expenses loomed large. The manufacturer turned to his local Dayton V-Belt Distributor for suggestions. He recommended replacing the original prime mover with a 250-HP electric motor. This eliminated the necessity of replacing and operating the worn-out boilers. Further, though only 13 feet of floor space were available, the Distributor worked out a Dayton V-Belt short-center drive that made use of the original, flat, 8-foot-diameter pulley without removing the 5/8-inch crown.

In the first year of operation, the new motor and drive reduced power plant operating costs over $3,000!

Your own local Dayton V-Belt Distributor can give you similar help with your power transmission problems. With his specialized knowledge he can eliminate nearly 95 per cent of all power drive troubles using standard Dayton V-Belts and the power drive accessory equipment he stocks. If necessary, he can quickly secure the aid of a Dayton power transmission specialist. So, for prompt, profitable solutions to your drive problems call your local Dayton V-Belt Distributor.

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Dayton Rubber

editorial

The Man in The Middle

IN all the publicity and discussion of labor-management problems much is said for and against each side but little is said about the man in the middle—the foreman or supervisor. The foreman has long been a bone of contention; and every effort has been made by unions to take foremen in or separately organize them, but without success. Now the Taft-Hartley Act puts foremen back in management ranks—which is where they belong. This, to some employers, settles the foreman problem. But does it? Foremen have their own problems, grievances and irritations, some of them dating back for many years. One can recall that in Code days in the early 30's employers had to raise all wages up to a certain minimum. Many employers, however, either through thoughtlessness or a desire to compensate for these increases during the depression period, failed to give commensurate increases or any increases at all to their foremen. This meant that many foremen were paid little more than even the lowest type of labor under their jurisdiction, a condition which created much bitterness and dissatisfaction. As a result employer-employee relations suffered because a dissatisfied foreman doesn't have his heart in his work and mishandles it and his men. His attitude, also, is contagious and has its effect on the men under him.

During the years since Code days this condition has improved considerably, probably partly because employers could afford to pay more and partly because they have become more enlightened on personnel problems. Yet, according to the National Foremen's Institute, Inc., despite the good reasons for management to be concerned with the complaints and thinking of their foremen, few firms have made an organized approach to this problem.

The Institute has developed a Foremen's Opinion Poll in order to discover what foremen are thinking, what their grievances are, and what ideas they have for solving production and personnel problems. Any employer with a sufficiently large number of foremen should find it profitable to find out what his foremen's replies would be to such an opinion poll. Employers with only a few foremen should already know the answers to most of these questions, but if not they should be able to get them direct.

The National Foremen's Institute received more than one thousand replies to a mail questionnaire which is sent to foremen in more than 20 different industries. Complete anonymity was promised and those answering were not required to sign their names. When these replies were tabulated and analyzed it was found that more than 55 percent of the foremen felt that their responsibilities and authorities need clarification by top management and about 50 percent believed that company training of supervisors is needed in management policies and planning.

With such facts as these before him, an employer would have a real basis for taking specific action to improve relations with his supervisors. Employers are cautioned that complete anonymity is necessary in order to insure an honest expression of opinion and that sufficient time must be allowed for the return of the questionnaires. The returns must be carefully and objectively analyzed and the most serious complaints and recommendations promptly acted on. It is also recommended that such polls be taken regularly—once a year—as replies will become more candid and revealing as management continues to show its good faith by doing something about the suggestions made by the foremen.

Blasting Caps

IN spite of all precautions, accidents in industry continue to happen and always will. Safety precautions, safety education and other preventive measures are gradually reducing the huge annual toll and we can be certain that this progress will continue. The most distressing—because unnecessary—of these accidents are the ones resulting from carelessness, either on the part of the employee or the employer, and it is this type which can and should be eliminated. Particularly tragic is the toll of children killed, blinded or maimed by blasting caps.

The use of explosives in industry is getting safer every year due to improvements in the product by the manufacturer, the educational work that has been done on the handling and use of explosives, and the growing realization that blasting is a job for a trained specialist. Blasting accidents in nonmetallic mineral mines and quarries are now exceedingly rare.

There has, however, been little reduction in the number of blasting cap accidents to children, as any newspaper reader can testify, and these accidents are due entirely to the carelessness of those who leave caps where children can get them. Trained blasters, other workers, and most other adults would know better than to tamper with a blasting cap, but children are curious, as Nature intended they should be. They will light caps, throw them into fires, hammer them, or pick at them with nails. Any of these methods can set off a cap.

The latest figures on blasting cap accidents show that from January 1, 1947, to September 30, 1947, a total of 86 children were injured while playing with such caps. From July 1 through September 30 a total of 31 children were injured in 16 accidents—six in each of two accidents. Of these 31 children fortunately none was killed—but four were blinded for life and the others were maimed for life with the loss of hands, arms or legs or were otherwise seriously injured.

According to the National Safety Council, such accidents are not confined to mining districts, but reports of such accidents in mining communities are received more often than is commonly realized. Only a few weeks ago the newspapers told of such an accident near a quarry in which six children were injured, three seriously. The only way to reduce the number of such accidents is to keep blasting caps under lock and key and to permit them to be handled only by the blasting crews who must be held accountable for them. An inventory on these caps should be kept just as carefully as on explosives.

Walter E. Trasser

news of the industry

PIT AND QUARRY

Freeport Reports Higher Production and Sales But Lower Earnings

Production and sales of Freeport Sulphur Company were at high levels in 1947, but earnings declined, mainly because of increased operating costs, Langbourne M. Williams Jr., president, reported.

Net earnings for 1947 amounted to $3,110,711, or $3.89 per share on the 800,000 shares of common stock. These earnings are the same as the preliminary figures announced in January. Earnings for 1946 were $3,753,316, or $4.69 per share.

"During the year substantial progress was made in the program begun in 1945 to expand and improve the plant and facilities at Grande Ecaille," Mr. Williams stated. "The program has been partially completed and some of the facilities have already been placed in operation."

Victory III Placed in Service By Dravo's Keystone Division

To assist in pushing barges of sand and gravel on the Ohio, the Monogahela, and the Allegheny Rivers for the Keystone Sand Division, Dravo Corporation, Pittsburgh, Pa., a new and modern diesel towboat named the *Victory* was launched recently at the Dravo boat yards, Neville Island, near Pittsburgh.

The is the third boat of the name in the service of the company. The first *Victory* was a steamer and is still operating for another owner under a new name. The second was recently sold by Dravo to the Argentine government. The new craft is much like two other towboats of the Keystone Sand Division. These were named the *Freedom* and the *Wm. Pitt.*

Natl. Gypsum Co. Releases Statement on Court Decision

Commenting on a Supreme Court decision that the National Gypsum Company and six other companies had violated the Sherman Anti-Trust Act by using patent-license agreements which contain price-fixing provisions, officials of the National Gypsum Company said that the finding "has no bearing on present operations . . . nor have the price clauses referred to been in effect for several years."

"The price agreements," the statement continued, "were stopped before the war by voluntary action of the companies. The margin of profit of the National Gypsum Company has been reduced, rather than increased, since the war, and the products generally have had smaller price increases as compared to other building products or as compared to increases in other industries.

"National Gypsum's prices have increased less than 30 percent since the war in the face of labor-rate and material price increases of over 100 percent."

Coming Events

April 5-7, 1948—Hot Springs. Annual convention, National Lime Association, The Homestead.

May 12-14, 1948—Hot Springs. Annual meeting, National Industrial Sand Association, The Homestead.

June 4, 1948—Chicago. Directors' meeting, Agricultural Limestone Division, National Crushed Stone Association, Edgewater Beach Hotel.

July 8, 1948—Hot Springs. Directors' meeting, National Crushed Stone Association, The Homestead.

July 16-24, 1948—Chicago. Annual convention and road show, American Road Builders Association, Soldier Field.

September 20, 1948—Colorado Springs. Directors' meeting, National Ready Mixed Concrete Association, The Broadmoor.

September 22, 1948—Colorado Springs. Directors' meeting, National Sand and Gravel Association, The Broadmoor.

October 20-22, 1948—White Sulphur Springs, W. Va. Fall meeting, National Industrial Sand Association, The Greenbrier.

Dodge Corporation Finds Building Contracts Set New High Mark in January

F. W. Dodge Corporation reported that the dollar volume of construction contracts awarded in January in the 37 states east of the Rocky Mountains set a new high mark for a January in the Dodge statistical series dating from 1925. The month's awards totaled $615,206,000, and represented a gain of 8 percent over January of last year, when the previous dollar-volume high for the month was reported. January's awards, however, were 2 percent less than the total for December.

January's nonresidential contracts awarded for projects east of the Rockies amounted to $240,544,000, showing a gain of 20 percent in this classification of building over January of last year. Heavy engineering awards also showed a 20 percent gain.

Residential contracts totaled $238,098,000, showing an 8 percent decline from January of last year and a 5 percent gain over December.

National Gypsum Co. to Begin Operations at West Coast Plant

National Gypsum's multi-million-dollar expansion program is going to make West Coast gypsum producers perk up and take notice soon. The Buffalo company officials have been eyeing the lucrative Western gypsum market for some time but has been unable to compete in the area because of high freight costs. Now they aim to lick that problem by building a West Coast plant.

Company engineers have discovered the existence of a large highgrade gypsum deposit in Imperial County, Calif. Claims have been filed and title is expected to be received from the government shortly. The modern plant to be built on the property will produce gypsum board, lath, plaster and other gypsum products.

A battery of six Nelson No. 5 inclined furnaces has recently been shipped to Argentina by the Victor J. Nelson Engineering & Construction Co. of Burbank, Calif. They will be installed in a new lime plant being erected near Buenos Aires by Heado Industrial.

$136,196,038 Appropriated To Bureau of Reclamation For Current Fiscal Year

Appropriations by the Congress for the Bureau of Reclamation for the fiscal year 1948 amounted to $136,196,038, of which $97,785,038 was made available in the regular appropriation, supplemented by additional sums amounting to $38,411,000.

Contrasted with the total expenditure of about $125,000,000 in the fiscal year 1947, of which about $30,000,000 (about 24 percent of the total expenditure) was spent for dams and appurtenant works, is the estimated total expenditure of over $200,000,000 for the fiscal year 1948. It has been estimated that $50,000,000 or 22 percent of the total estimated expenditure for the fiscal year 1948 will be required for the construction of dams and appurtenant works.

An average cost index as of July, 1947, for representative Bureau of Reclamation construction comprising dams, power plants and pumping plants, transmission systems, permanent camps and waterways had increased nearly 90 percent since 1940 and was about 16 percent higher than the average index of July, 1946.

Although the cement shortage is critical throughout the western United States, the area of greatest shortage is in the Northwestern states, namely, Washington, Oregon, Idaho, and Montana. Projects in these states on which construction has been approved will require approximately 8,650,000 barrels of cement for completion.

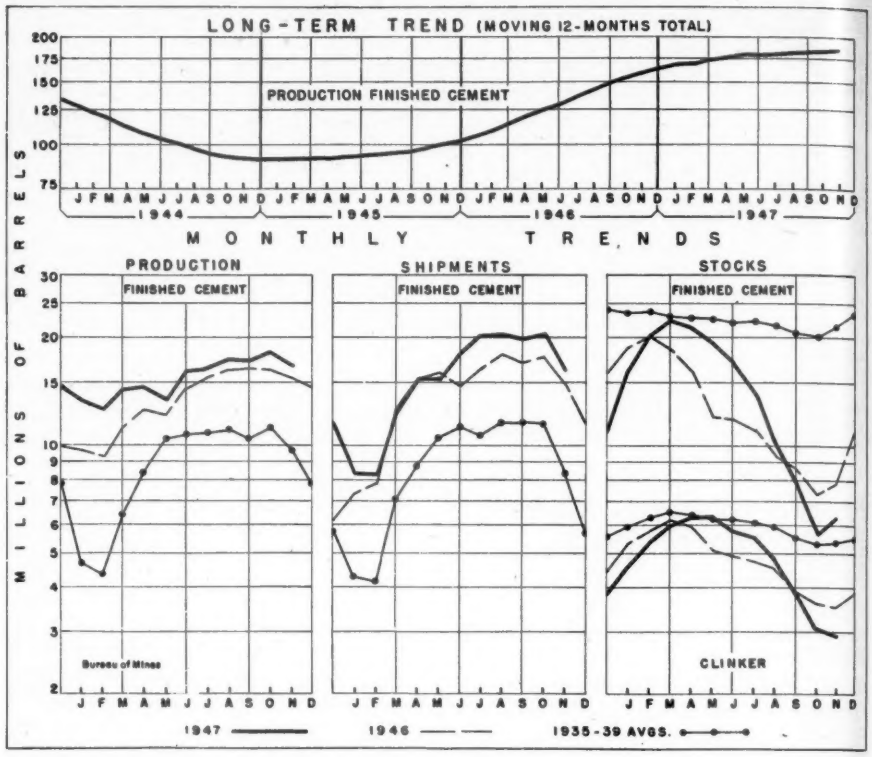
Approximate Amount of Cement Used on Bureau of Reclamation Projects in 1947 and Estimated Requirements for 1948. (In Barrels)

Project	1947	1948
Missouri Basin (Kortes, Enders, Boysen and Angostura Dams)	80,000	450,000
Central Valley	390,000	360,000
Hungry Horse	5,000	20,000
Davis Dam	25,000	250,000
Columbia Basin	80,000	100,000
Colorado-Big Thompson	40,000	60,000
All American Canal	60,000	50,000
Boise Project	30,000	30,000
Others	40,000	30,000
Total	750,000	1,350,000

Giant Portland Cement Co. Organizes New Subsidiary

A new company, the Carolina Giant Cement Company, has been formed by the Giant Portland Cement Company of Philadelphia, which recently purchased the Ancor plant at Harleysville, S. C., from the War Assets Administration for $666,815.

The facilities of the new firm, used during World War II for the manufacture of alumina oxide, will be converted into a cement plant. Carolina Giant is a wholly-owned subsidiary of the Giant Portland Cement Company.



Production of 16,814,000 barrels of portland cement in November, 1947, reported to the U. S. Bureau of Mines was 10 percent greater than that reported for November, 1946. Mill shipments reached 16,267,000 barrels, which also are 10 percent above the figure reported for November, 1946. Stocks of cement at the end of November, 1947, reached 6,215,000 barrels and although this figure represents a decrease of 21 percent from the November, 1946, figure, it also represents an increase of 547,000 barrels from the October, 1947, month-end total.

The percentage of capacity utilized in November, 1947, was 85, an increase of 7 percent over that reported for November, 1946.

The long-term trend in production of finished portland cement, as indicated in the accompanying chart, has reached an all-time high of 184,967,000 barrels, or 2,185,816 barrels above the previous record output of 182,781,184 barrels for the twelve months of 1942. Monthly production, shipment, and stock trends, as compared with the 1939 average, are also indicated graphically.

Fire Destroys Graphite Mill At Changewater, New Jersey

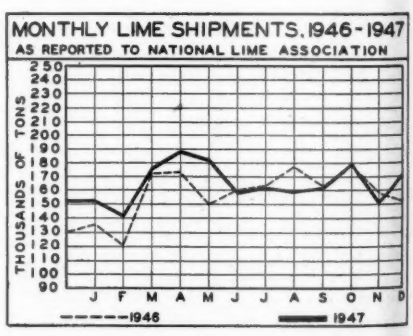
Despite the efforts of 70 firemen, the five-story plant of the Changewater Graphite Mills at Changewater, N. J., was razed by a fire several weeks ago.

Quantities of refined graphite and much machinery in the plant were destroyed in the blaze, which for a time threatened a trestle of the Delaware, Lackawanna and Western R.R. adjacent to the mill. The fire was believed to have originated in a diesel engine on the first floor.

Reviving Granite Industry Presents Optimistic Outlook

Figures released by the Barre, Vt., Granite Association show the 1946 production at over $14,500,000, a 35 or 40 percent increase over pre-war figures, with tonnage output increased 5 to 10 percent.

This booming business, however, has brought local problems to Barre. Citizens of the town are complaining about loss of sleep due to night operations in the quarries. Rebuttal of the quarry operators is that a 16-hour two-shift working day is necessary to meet the competition from other areas.



According to data collected by the National Lime Association, 44 companies in December, 1947, shipped 170,518 tons of lime (106,912 quicklime; 63,606 hydrate). Reporting companies represent 49 percent of the association members' total capacity of record. Based on Pit and Quarry's estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 382,800 tons. Shipments of lime by uses and grades for December, 1947, were:

	Quicklime (tons)	Hydrate (tons)
Agricultural	788	4,550
Building	11,008	34,449
Chemical	95,116	24,607
Total	106,912	63,606

29th Annual Convention Of Contractors Attracts More Than 1300 to Dallas

The Associated General Contractors of America, Inc., held their 29th annual convention in the Baker and Adolphus hotels, Dallas, Tex., February 9-12. Although complete attendance records have not yet been tabulated, it is estimated that in excess of 1300 persons attended the four-day meeting.

One of the most significant actions taken at the A.G.C. meeting was the ratification of a plan for the establishment of a national joint board for the settlement of jurisdictional disputes. Seven national organizations representing specialty contractors now have approved the plan.

Richard J. Gray, president of the Building and Construction Dept., A. F. of L., told the A.G.C. that he had every expectation of early ratification of the plan by his executive council. Mr. Gray said that, following council approval, labor would meet with representatives of the employers and proceed immediately to put the board into operation.

23 Gold Star Service Men Honored by National Gypsum

Top executives and plant managers of the National Gypsum Company recently paid tribute to the company's 23 employees who were killed in action during World War II. A plaque, dedicated to the Gold Star heroes, was unveiled in the company's headquarters in Buffalo, N. Y.

This was one of the highlights of the annual meeting of the company's 25 plant managers from all parts of the country. At a banquet in Hotel Statler, the plant managers and executives honored Gordon H. Tarbell, who recently relinquished his active duties as vice-president in charge of production. Mr. Tarbell, one of the company's founders, continues as a director and in an advisory capacity.

Michigan Limestone Company Buys Thunder Bay Quarry

The Michigan Limestone and Chemical Co. of Rogers City, Mich., has announced the purchase of crushing, screening and loading equipment formerly owned by the Diamond Alkali Co. at its Thunder Bay quarries. The latter company, which began its operations in 1931, is disposing of its holdings, having announced last fall that it was closing out its plant at Thunder Bay. They had recently sold their steam-electric equipment to the Alpena Power Co.

Michigan Limestone and Chemical Co. officials stated that the purchase of the modern stone loading pier and the crushing and screening plant was deemed advisable because of increased demands by steel and chemical plants for stone. They said the company would now be assured of suitable replacement equipment to furnish large quantities of limestone now required.

Basic Refractories, Inc. To Enter Brick Industry At Maple Grove Plant

Expansion of its Maple Grove, O., plant to provide facilities for the manufacture of basic brick used in the lining and relining of rotary kilns, has been authorized by the board of directors of Basic Refractories, Inc., of Cleveland.

The new facilities, which are expected to be ready for production by the latter part of 1948, will mark an important milestone in the company's production history. Heretofore it has concentrated on the manufacture and sale of granular dolomite, magnesia and chrome refractories. Basic's brick plant will be the only one of its kind in Ohio and the Midwestern area. The manufacture of brick of this type is now largely confined to the Baltimore-Philadelphia area. Much of the new plant's output will be used in the cement industry.

Harry E. Battin Jr. Heads N. Y. Crushed Stone Assn.

Harry E. Battin Jr., vice-president of the Callanan Road Improvement Company, South Bethlehem, N. Y., has been elected president of the New York State Crushed Stone Association.

Other officers include Hiram W. Barnes of Rochester, vice-president, and H. E. Rainer, Buffalo, treasurer. Harry R. Hayes is executive secretary and engineering director of the association, with offices in Albany.

• The General Crushed Stone Company, Easton, Pa., sent this delegation to the National Crushed Stone Convention. Seated: A. G. Seitz, John Rice Jr., Redington Moore, O. M. Graves, O. E. Benson. Standing: E. S. Watson, L. M. Croll, E. E. Dotter, J. F. Coleman Jr., C. A. Reid, M. Bovee, J. W. Richards, C. T. Johnson, H. H. Wagner (manager, Pennsylvania Stone Producers' Assn.), D. C. Hickey Jr., T. J. Trainor, G. E. Schaefer, W. J. Hinds, Maurice Alderman, Guy Faylor, Harry McGuirk. On the stairway: Glenn Lanning, W. H. Litteer, I. H. Boggs, J. W. Harward, A. R. Nash, Clive Blowers, K. W. Brassington, W. M. Lunan, H. F. Yotter, Merl Price and J. P. Cox.

Sixty Days on a Gravel Dredge—Or the Log of the "Franklin"

The saga of a gravel dredge's 4,000-mile voyage from Pittsburgh to Philadelphia, as recorded by Harry B. Collier in his record as marine engineer of the Warner Company's craft, the *Franklin*, would make exciting reading; but because of space limitations, only the salient features of the trip can be mentioned.*

• The white line shows the 4,000-mile course of the Franklin's voyage.

Mr. Collier's log was kept in a little black book labeled in gold letters, "Engagements," and told the story of the longest engagement he ever had.

The *Franklin* left the Dravo shipyard in Pittsburgh on November 1, 1947, at 3:30 p.m., towed by the towboat *Peace*. On November 5 a new towboat, the *Lehigh*, took over and continued the voyage until the dredge reached New Orleans. All along the Ohio and the Mississippi the towboat picked up other craft for delivery to various river cities. By Nov. 15 the dredge had passed through 53 locks and was 981 miles from Pittsburgh. But there were still 870 miles to go to New Orleans.

According to the log of the *Franklin*, many days were cold and rainy. Fog often held up the string, and once the wind blew the dredge and its companions against the bank. All hands were happy when New Orleans was sighted. In this city the dredge was held up for several days while additional sheathing was put on to prepare for the ocean trip. This work was done at the Todd shipyard.

From New Orleans the tug *M. Moran* became the leader. On December 5 it left New Orleans, and the next day it was in the gulf.

Once in the Gulf of Mexico, the weather was warmer; however, there were rough days, and often continuous pumping was necessary to keep the water out of the dredge. From New Orleans to Chesapeake Bay one of the most frequent entries in the log of the *Franklin* was: "Dredge jumping and pitching."

By December 13 the dredge was well up the Florida coast; but on that day strong northeast winds and heavy seas necessitated turning back. (This part of the trip is shown by the dotted line on the map.) On December 14 the tug and the dredge put in at Fort Pierce, Fla. More trouble was to come. The tug ran ashore, and the captain was forced to cut the hawser. This meant that the dredge was twice swung against the bank, but with the aid of a pilot boat and a Coast Guard cutter, it was finally conveyed to a safe anchorage.

At Fort Pierce additional planks were fastened to the *Franklin's* bow and sides for the rest of the rough trip. A second tug, the *Joseph H. Moran II*, arrived to relieve the *M. Moran*.

After a wait of several days for more favorable weather, the trip was resumed under sunny skies. But soon a head wind and rough seas were the order of the day. Followed more rolling and jumping and more pumping, as well. By December 24 conditions were so hazardous that it was decided to put in for Charleston, S. C., where the convoy remained until December 27. Thereafter, however, the voyage was comparatively smooth, until the *Franklin* and its escort reached the Delaware Canal. Here the dredge struck a bridge and broke loose from the tug.

Eventually this mishap was mended, and early on the morning of December 31, "a collective sigh of relief almost blew the *Franklin* back to Pittsburgh" as the dredge put in at the Berks Street wharf in Philadelphia. And so ended a 4,000-mile ocean voyage between two points only 260 air miles apart.

*Our source was the February, 1948, issue of the *Warner News*.

• The dredge "Franklin" being towed down the Mississippi River by the tug "M. Moran". Note protective sheathing on the dredge.

Giant Portland Cement Co. Registers Stock Issue

Giant Portland Cement Company of Philadelphia has filed with the Securities and Exchange Commission a registration statement covering 564,906 shares of common stock and 283,453 common stock purchase warrants. The warrants will entitle purchasers to buy additional common stock from July 1, 1948, to October 1, 1951. Proceeds of the shares and warrants are to be used to develop plants of a subsidiary, the Carolina Giant Cement Company of Harleyville, S. C.

Ideal Cement Company Absorbs 8 Subsidiaries In Consolidation Move

The Colorado Portland Cement Company consolidated with its parent concern, Ideal Cement Company of Denver, Colo., as of January 1, 1948, according to word from Cris Dobbins, vice-president and general manager of Ideal.

The Ideal Cement Company is currently engaged in an extensive expansion program reported to involve over $12,000,000, with principal production increases planned in Colorado, Utah, Texas and Arkansas. When the new project is completed, sometime this year, Ideal will be the fifth largest producer of portland cement in the United States.

Mr. Dobbins stated that a consolidation of all cement operations under one company had been under consideration for some time, in order to simplify operating and selling practices and to render better service through uniformity of policy and resultant economies. The merger was effected on December 31, 1947, when all of the cement producing and selling activities of Ideal's many subsidiaries were consolidated.

The subsidiaries merged with Ideal which will shortly lose their corporate identity, in addition to the Colorado Portland Cement Company, included the following: Arkansas Portland Cement Company, Gulf Portland Cement Company, Nebraska Cement Company, Oklahoma Portland Cement Company, Union Portland Cement Company, Three Forks Portland Cement Company and United States Portland Cement Company.

No changes in policy or personnel are contemplated, said Mr. Dobbins. Charles Boettcher, in his 96th year, still maintains his title as president of the company. Headquarters of the firm continue to be in Denver in the Denver National Building, the first reinforced concrete multi-storied office structure built in the city. Into it Charles Boetscher moved his office and that of the Ideal Cement Company in 1908.

Dow Chemical Company Buys Magnesium Chloride Facilities

Final steps in the purchase of the facilities of a wartime magnesium chloride plant at Ludington, Mich., were completed recently by the Dow Chemical Company through the War Assets Administration.

It was announced that for the present steps will be taken to utilize as much of the existing equipment as possible. At present only about 35 percent of the plant is used in the production of commercial lime and magnesium chloride for oxy-chloride cement.

$500,000 Modernization Gives Los Angeles Plant 1,000-T.P.H. Capacity

When improvements now in progress at the Irwindale, Calif., plant of the Consolidated Rock Products Co., Los Angeles, are completed, the plant will be the largest and one of the most modern in the West. New capacity will be about 1,000 t.p.h.

Chief among the improvements is a 2,300-ft. stacker conveyor which will bring pit-run material from a new deposit and build up a raw surge pile in a worked-out pit section. There will also be a new crushing and primary-screening structure, and a number of new screens are to be installed. The existing 5½-ft. and 4-ft. Symons cone crushers will be moved to a new location and new 7-ft. and 5½-ft. crushers will be added. A bridge crane of 20-ton capacity will be provided to service these four crushers, which will be set in line over a reinforced concrete tunnel. The entire project will cost in the neighborhood of $500,000, according to R. C. Griffin, production manager, who, with Harry Jumper, Consolidated's chief engineer, conceived the new development. Plans were prepared under the direction of Arthur E. Howland.

Consolidated's own construction crew is doing the job under the supervision of Norman Harelson.

• The new sand and gravel plant of the New York Trap Rock Corporation at Port Washington, Long Island, shortly after it went into operation. Shovel loading to pit hopper is in foreground; barges are shown being loaded from stockpiles at right.

Series of Excellent Talks Highlight A.E.D.'s 29th Annual Meeting at Chicago

More than 1500 machinery distributors and manufacturers overflowed Chicago's spacious Edgewater Beach hotel, February 15-19, for the Associated Equipment Distributors' 29th annual meeting. The meeting happily demonstrated, by force of the excellence of the program, plus the enthusiastic attendance and support of its members, that the A.E.D. is definitely a "big-time" association. Among the speakers were Edward R. Carr, president of the National Association of Home Builders; Dwight W. Winkelman, president of the Associated General Contractors of America; Ed Wimmer, vice-president of the National Federation of Small Business; Kenton R. Cravens, member of the American Bankers Association, credit policy committee; Col. Robert J. Fleming Jr., Corps of Engineers; and E. Charles Eichenbaum, chairman, Federal Excise Tax Section, American Bar Association. Harry J. Hush, Griffin Equipment Corp., New York, N. Y., was chairman of the A.E.D. convention committee primarily responsible for lining up this fine program.

A. F. Garlinghouse (Garlinghouse Brothers, Los Angeles), was elected as the new president. He succeeds William A. Danner of Boston. Other new officers are: W. W. Bucher, executive vice-president (R. E. Brooks Co., New York City); V. J. Sheridan, vice-president (Sheridan Equipment Co., Ltd., Leaside, Ont., Canada); C. F. Halladay, vice-president (Halladay-Dittman Co., Sioux Falls, S. D.); R. L. Arnold, vice-president (Arnold Machinery Co., Inc., Salt Lake City, Utah); Elden M. Farnum, treasurer (Allied Construction Equipment Co., St. Louis, Mo.); and Frank G. Knight, executive secretary (A.E.D., Chicago, Ill.).

Dwight W. Winkelman, president of the A.G.C., forecast that more than $15,000,000,000 would be spent for new construction in 1948 and that total expenditures for construction would probably approach $23,000,000,000 when maintenance and repair costs are added. He also made the following statement:

"There is a general feeling among contractors throughout the country that the construction needs of the nation are so great that there must be a high rate of activity in the industry for many years."

Speaking of rising prices, Mr. Winkelman thought that we were rapidly approaching the time of a stabilization in construction costs. He also pointed out that construction costs were not out of line with the national price trend and had lagged behind the general upward trend. While the index for wholesale prices of all commodities has increased 54 percent, construction cost indexes have moved upward only 37 percent. "My own conviction is that one of the most effective means of reducing construction costs is through increased mechanization," he declared. "The new machines we are getting now are improved in efficiency. They help us as contractors to cut costs on many of our operations."

Describing the Affiliation Program as an important, progressive development in the U. S. military machine, Col. Fleming declared, "It is a vital, functional modification that is necessary to keep our American model of a military machine up to date and capable of meeting demands that future jobs may place on it.

"Under the same conditions as prevailed in 1940, we need more than two years to get ready," he revealed. "Any aggressor nation, bent on a course of action risking involvement of the U. S., must knock us out in the early rounds."

Under the Affiliation Program, civilian agencies and individual companies agree to furnish key personnel and technical instruction for specialized service-units activated as components of the Organized Reserve. They agree to maintain each unit at the authorized strength with qualified men, while the Army furnishes equipment and supervises the military training. Col. Fleming estimated that these units could be put into the field in one-third to one-fifth the time which would otherwise be necessary.

A.E.D. approved the Affiliation Program for its members in October, 1947, and a number of member companies are already working closely with the Army in setting up reserve units.

• 1948 officers of A.E.D.—Front row: F. G. Knight, executive secretary; W. W. Bucher, executive vice-president; A. F. Garlinghouse, president; C. F. Halladay, vice-president. Standing: E. M. Farnum, treasurer; R. L. Arnold, vice-president; V. J. Sheridan, vice-president.

Carl D. Franks Elected Promotions Vice-President Of Portland Cement Assn.

Election of Carl D. Franks as vice-president for promotion of the Portland Cement Association was recently announced by Frank T. Sheets, president of the association. This action was taken at a meeting of the board of directors

Carl D. Franks

of the association on March 5. In this new responsibility Mr. Franks, under the direction of the president, will be in charge of the association's promotive activities throughout the country.

Mr. Franks has been a member of the association's staff since 1916, when he became district engineer in charge of the Indianapolis office. In 1924 he was made Midwestern regional manager and has been in charge of the work of seven district offices covering field promotion in 10 states.

Mr. Franks holds a Bachelor of Science degree in civil engineering from Purdue University.

Florida Highway Department Sets Budget at $61,375,601

Florida's state road department has tentatively adopted a 1948 budget calling for the expenditure of $61,375,601. The budget, on which final action was scheduled to be taken March 6, is lower than the record 1947 budget of $65,459,865. One reason for the difference, it was explained, lies in the fact that last year's budget included a carryover of $18,900,000 in surplus cash funds, largely accumulated during the war years. The new budget includes a cash carryover of only $7,646,000.

Florida's highway agency this year will concentrate on maintenance of existing roads and federal-aid construction projects, according to announcement by Chairman Elgin Bayless.

30 years ago in Pit and Quarry

by Walter E. Trauffer

AS FAR as the important national aggregates associations (crushed stone, sand and gravel and slag) were concerned the April, 1918, issue of PIT AND QUARRY carried comparatively little information, as the formation and first meetings of these three associations had been completely described in the two preceding issues. On February 26, 1918, however, the directors of the National Crushed Stone Assn. met in Baltimore, Md., and voted to incorporate in the state of Delaware. The late A. J. Blair, first president of the association, was instructed to appoint an executive committee from the board of directors which would be authorized to investigate such important subjects as the testing of materials, uniform cost accounting system, industrial insurance, labor matters, publicity and promotion work, by-products, freight rates and contractors' relations. Most of these subjects are just as important today. This committee was also given the authority to elect a permanent association secretary.

On the day after this meeting the directors called on Oscar A. Price, personal secretary to the director general of railroads, Wm. G. McAdoo. He informed them that the serious congestion of loaded freight cars was being solved and that under the new system all freight cars were being pooled and should be capable of handling all freight of the country. Mr. Price also said that every railroad bed would be put in excellent condition, implying a large and continued demand for ballast.

The directors then called on L. W. Page, director of the U. S. Office of Public Roads, who told them that the amount of short-haul freight over public roads was increasing at an amazing rate. He expressed the belief that more money than usual would be spent in 1918 for road building.

As a result of these and other encouraging developments the danger that the aggregates industries might be sacrificed to the war effort seemed to have passed. The editorial in this issue was on an optimistic note, pointing out that the demand for ballast, highway materials, war plant construction and government work would compensate for the drop in residential, municipal and general construction work. Another article on road building pointed out that the highway expenditures planned for 1918 totaled $263,096,610, about 82 percent more than in any previous year.

The section on association activities told of a meeting of Minnesota crushed stone producers at Minneapolis on March 8 at which The Crushed Stone Producers' Assn. of Minnesota was formed. C. D. Brewer (Duluth Crushed Stone Co., Duluth) was elected president. It was decided at this meeting to affiliate with the national association.

In this issue also was a biography of A. J. Sullivan, treasurer of the National Crushed Stone Assn. He was at that time vice-president of the U. S. Crushed Stone Co., Chicago, and had served as president of the Illinois Crushed Stone Assn. in 1911-1913 and in 1918.

A "Men of the Industry" story told of the career of F. W. Renwick, president of the Chicago Gravel Co., Chicago, a title which he still holds. Mr. Renwick entered the sand and gravel business in 1896 with a small plant near Chicago. The growth of his business and the industry was described, as well as his important work in the formation of the National Association of Sand and Gravel Producers, of which he was the first president (from 1912 through 1916).

The feature plant article in the April, 1918, issue described the excellent new finishing lime plant of the Ohio Hydrate & Supply Co. at Woodville, O. This plant was designed to be as nearly automatic as possible from the quarry through the loading out of the finished products; fewer than 20 men were required to produce 300 tons of hydrate daily. The twelve shaft kilns had automatic stokers and were drawn by remote control to a pan conveyor for grinding and storage. A poidometer automatically weighed out the lime to the 14-t.p.h. continuous hydrator. Pulverizing and air separation preceded the loading of hydrate and agricultural lime by three valve bagging machines. The Schaffer Engineering & Equipment Co., Tiffin, O., designed the plant, furnished much of the equipment and supervised its installation.

Also described in this issue was the sand and gravel plant of the Standard Builders' Supply Co., Grand Rapids, Mich., with a capacity of 600 cu. yd. daily. This plant was designed by J. C. Buckbee and was erected under the supervision of N. H. Battjes, general manager of the company. It had several unusual features, the most interesting ones being the provision for dry screening for winter operation, the use of a series of belt conveyors from the pit to the plant, and the production of crushed gravel from ¼- up to 2-in. sizes in addition to the regular sizes of dry and washed gravel.

At the end of the second conveyor from the pit there was a rotary screen over a bin. In freezing weather the sizing was done there and the products loaded out from this bin either into cars or trucks for shipment. At other times the material from this conveyor bypassed the screen to a third conveyor leading to the top of the main wet screening and crushing building.

Also in this issue were the following: another staff-written article on cost keeping for quarries, a thorough analysis of the cost of big-hole drilling, a discussion of hydraulic dredging, and many important news items. The "Men and Machinery" section described and illustrated such items as a cleaner for revolving screens, a cableway excavator, a shovel-type loader which could be easily dismantled and moved, a stone spreader, and what was probably one of the first truly portable crushing and screening plants. There were, of course, the usual advertisements by leading equipment manufacturers and many used equipment ads. Among the latter was one advertising for sale a complete cement plant at Bedford, Ind., with a capacity of 750,000 bbl. annually. Included in the equipment were ten 60-ft. rotary kilns and 32 Griffin mills.

• This cartoon by the then editor of Pit and Quarry was published in the April, 1918, issue, together with an editorial emphasizing the importance of government work to the aggregates producing industries.

New Office and Laboratory of the N.C.S.A. in Washington*

Association owned building gives adequate space and facilities for carrying on present and future work

EVERY member of this association should take the first opportunity to visit the new office and laboratory to see for himself the very splendid plant which we now own. It is a thing to be very proud of and a great deal of credit and thanks should go out to the building committee and the members of our staff who planned it and carried it through to completion under very unfavorable circumstances.

The new building is situated at 1415 Elliot Place, N. W. This is a very suitable location in a very good neighborhood and is a far cry from the dark and dingy second floor at the old address where it was unpleasant to go at any time and unsafe for the girls after dark.

The new address is only about fifteen minutes by taxi from the center of town. There is a bus line which passes about a block away. For those who go by motor there is ample parking space in our own yard or on adjacent streets.

The offices and laboratory are housed in a steel and concrete building with a total floor space of 6500 square feet. The building may be entered from either of two street

*A report delivered by Stirling Tomkins before the Board of Directors, National Crushed Stone Association at Cincinnati on January 25.

Members of the National Crushed Stone Association and crushed stone producers in general are fortunate to have representing their interests such an alert and progressive association. Much has been published in these pages about what the N.C.S.A. has done for its members. Now, with this new laboratory and office building, one of the few and one of the best owned by any association, an even better job can be done. Crushed stone producers, whether association members or not, have benefited, and will continue to benefit from the work of the association, as nearly all its efforts, whether technical research or otherwise, advance the cause of crushed stone and its producers.

This description of the new building and its contents was a feature of the recent N.C.S.A. convention and was presented there by Stirling Tomkins, a member of the executive committee.—The Editor

• Below, left: A general view of the offices, including those of the administrative director and the managing director of the Agricultural Limestone Division.

• Right: Another office view, showing quarters of the engineering director and the field engineer.

• The exterior of the National Crushed Stone Association's new headquarters, showing the entrance on Elliot Place, Washington, D. C.

• A general view of the southeast corner of the laboratory. In the foreground is the testing track; the 300,000-lb. testing machine is on the right.

levels. The offices, which are mainly on the second floor and are entered from the upper street level, occupy 3000 square feet including storage space in the attic. The street entrance is very attractive. It opens into a large room containing the desks of the secretaries and the files in steel filing cabinets. The decorations are simple but attractive. Off this room on one side are four doors leading to the individual offices of the administrative director (J. R. Boyd), the engineering director (A. T. Goldbeck), the field engineer (C. E. Gray), and the director of the agricultural limestone division (H. Huschke). The impression created on viewing this interior is one of an efficient and well run business office.

On the side of the room opposite the private offices is the mailing room in which are located the mimeograph machine, the addressograph machine, and the supplies that are necessary to this work.

Up the stairs from the office floor level is a room being used to good purpose for storing extra copies of the issues of the *Crushed Stone Journal, Useful Information Bulletins* and other papers and periodicals for reference. This room provides ample additional storage space for stationery, old files not required for ready reference and the like. There are convenient toilet and washroom fa-

cilities and locker space and a small kitchen equipped sufficiently to enable the staff or employees to cook their own hot lunches if they so desire.

Opposite the entrance door is the stairway leading to the laboratory. As previously stated, the laboratory may be entered also from the lower street level, a great convenience in the handling of samples and the disposal of the residue after making tests.

The laboratory itself occupies approximately 3500 square feet of floor space. It is equipped for making all of the ordinary routine tests on stone for construction purposes, for making concrete investigations, and for research in bituminous concrete. Within the laboratory there is a separate room for crushing, screening and the noisy type of testing, a large room in which are located most of the testing machines including the circular track, a moist room, a boiler room from which heat is provided for the entire building, and a washroom.

Being on the ground floor, all the testing machines have been set up on concrete foundations and thus their operation does not cause any undue disturbance throughout the rest of the building. Our engineering director has planned the arrangement of the machines with great care. There is ample space between one machine and another, so that the use of one does not prevent the use of another at the same time.

The whole laboratory is well lighted and airy and altogether a very pleasant place in which to work.

Just a few feet across the way from the lower level entrance to the laboratory and within the plot of land which we own are situated a number of unheated garages which are joined together to form one building having about 1000 square feet of floor space. This space is ideal for the storage of newly-received samples and temporarily unused materials and equipment.

Space in this report does not permit inclusion of a detailed list of the principal items of equipment used in the laboratory. Knowledge of this equipment is, however, important to a full appraisal of our establishment and you will find in Appendix A (below) a list of the machines and a brief description of each furnished by our engineering director.

Appendix A—NCSA Laboratory Equipment

The equipment in the National Crushed Stone Association laboratory includes four types of testing equipment, as follows:

1. Stone Testing Equipment
2. Concrete Testing Equipment
3. Bituminous Concrete Testing Equipment
4. Crushing and Screening Equipment

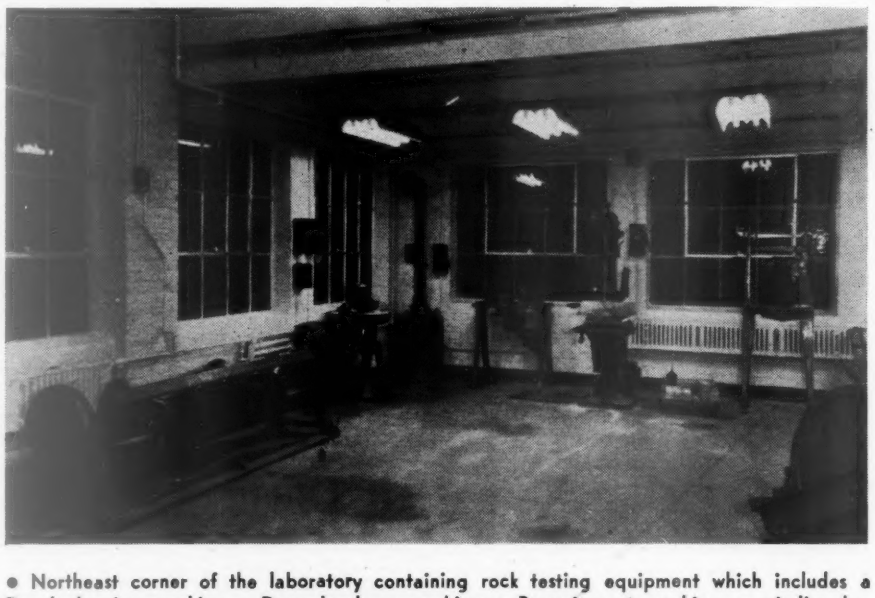
Stone Testing Equipment This consists of the Deval abrasion machine, a Los Angeles abrasion machine, a Dorry hardness test, a standard toughness tester, and a molding machine for cementing briquettes, diamond core drill and diamond saw.

The Deval abrasion machine was originated in the French School of Roads and Bridges many years ago and is used for determining the abrasion resistance of road-building rock. It was originally designed for use with macadam stone and is rapidly being superseded by the Los Angeles abrasion test.

The Los Angeles abrasion machine is a cylinder 28 inches in diameter and 20 inches long, having a radial shelf 4 inches wide extending throughout the entire length of the drum. The drum is rotated at a speed of from 30 to 33 r.p.m., and 500 revolutions are required to complete the test. A graded sample of commercially produced stone is used, together with a charge of steel shot. This machine is intended for determining the abrasion resistance of rock and is said to simulate service behaviour much more closely than the Deval abrasion machine.

The Dorry hardness machine consists of a revolving steel disk upon which a 25-millimeter core drilled from the rock is held under a given pressure and upon which is fed crushed quartz of a given size. Rotation of the steel disk results in a wearing away of the core of rock at a variable rate depending upon the hardness of the rock. The wear resulting after 1,000 revolutions of the disk gives an index of the hardness of the rock. This machine determines the resistance of rock to surface abrasion. Unlike the case of the Deval abrasion machine or the Los Angeles abrasion machine the sample is not subjected to impact, but merely to surface wear. Consequently, the results obtained represent a basic property of rocks; namely, their hardness.

The Standard Toughness Test is frequently known as the Page Impact Test because it was devised by Logan Waller Page, at one time director of the then Office of Public Roads. The sample of rock to be tested is a core 25 mm. in diameter and 25 mm. high. The core is mounted on a steel anvil and is subjected to the impact of a 2 kg. hammer falling on a 1 kg. plunger, having a spherical end resting on the specimen. The height of fall is increased by 1 cm. after each blow and the number of blows, which corresponds with the final height of the fall bringing about failure, constitutes the toughness of the rock. The tougher the rock the greater will be the number of blows required to produce failure. Rocks having high toughness likewise have high compressive strength and high resistance in the Dorry abrasion machine and in the Deval abrasion machine. Toughness is also one of the basic properties of rocks and the tough-



• Northeast corner of the laboratory containing rock testing equipment which includes a Deval abrasion machine, a Dorry hardness machine, a Page impact machine, a grinding lap and diamond saw, a diamond core drill and a molding press for cementing specimens.

ness test reveals one of the important properties of rocks for road building and for other structural purposes.

A power-driven diamond saw and a diamond core drill are necessary auxiliary equipment used to prepare core specimens for the toughness and hardness tests.

The cementing value of rock dusts is still considered of importance in some localities and the laboratory is equipped with a machine for this test.

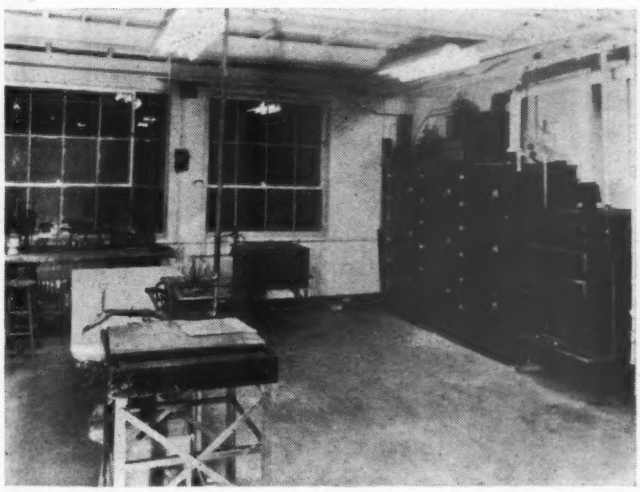
Concrete Testing Equipment The laboratory is rather thoroughly prepared for concrete testing with equipment consisting of the following:

1. A 3-cu. ft. "Little Wonder" concrete mixer.
2. A moist closet, thermostatically controlled to produce constant temperature conditions with 100 percent humidity. Water from a small sump built in the floor of the moist room is circulated by means of a small, shallow well pump and is electrically heated when necessary and cooled by means of a ½-hp. compressor. Mine sprays are used to create the necessary moist condition.
3. A number of 6- by 12-in. cylinder and 6- by 6- by 36-in. beam molds are a portion of the equipment.
4. A freezing cabinet is provided for making accelerated freezing and thawing tests to study the effect of freezing and thawing on concretes of different kinds.
5. The laboratory has a 300,000-lb. Southwark-Emery Testing machine for determining the compressive strength and beam resistance of concrete. This is a hydraulic machine employing the famous Emery principle for weighing the load.
6. A power-driven band saw is used for cutting specimens from concrete for various kinds of tests, such as freezing, volume change, etc.
7. A special vibrating table is used for making specimens by the use of vibration. Likewise, special workability tests are made on this machine.

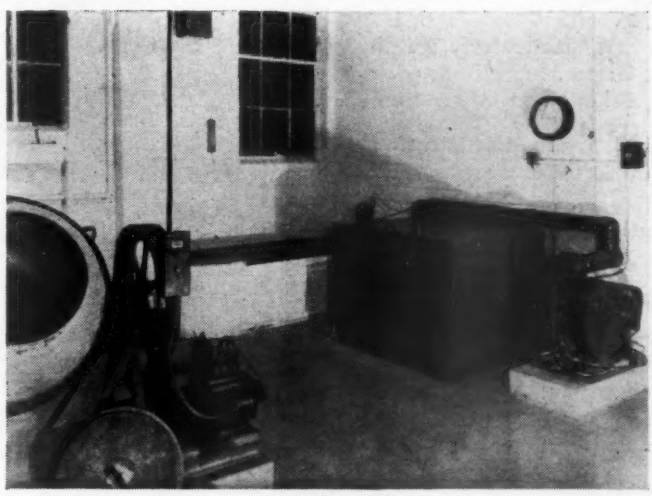
Bituminous Concrete Testing Equipment The following concrete equipment consists of:

1. A bituminous concrete mixing pan, heated by means of an oil bath.
2. A temperature control cabinet in which three different temperatures may be maintained by thermostatic control used for various kinds of tests on stone and bituminous concrete.
3. Necessary molds for making the compression-immersion test for determining the durability of bituminous concrete.

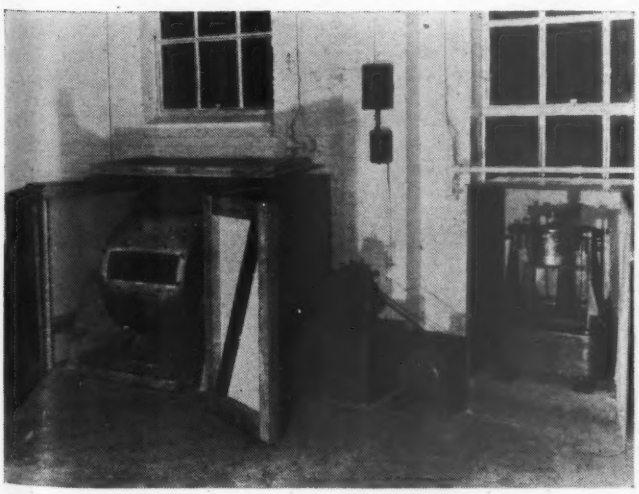
(*Continued on page* 74)



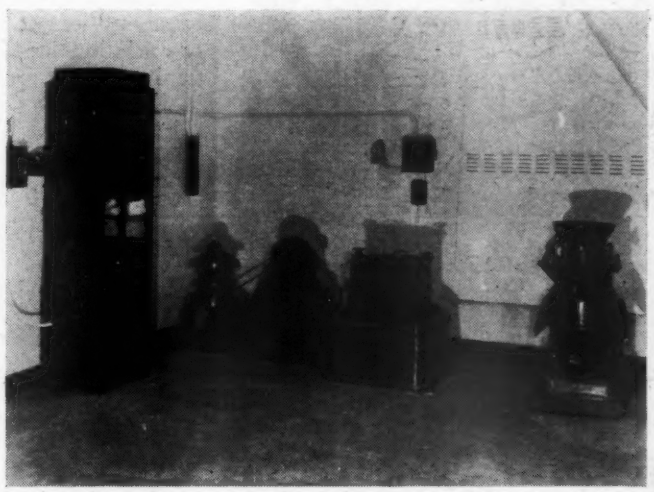
• Equipment for bituminous testing. Here are seen a drying oven with temperature control cabinet (corner), an oil-bath-heated mixing pan (foreground) and a constant-temperature water storage tank for storing durability specimens of bituminous concrete.



• The concrete mixer (left), the freezing cabinet and the thawing tank for durability tests of portland cement concrete.

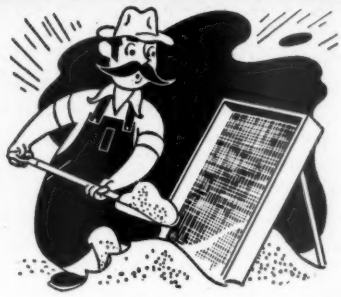


• The Los Angeles abrasion machine (left) encased in a Celotex cupboard to reduce the noise; at the right is the Ro-Tap sieving machine.



• Crushing, grinding and screening equipment for coarse aggregates. This room is provided with exhaust equipment for removing dust.

Screenings



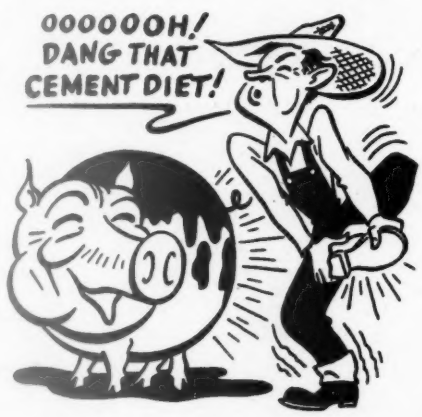
by William M. Avery

GRAVEL Gertie's blond-tressed off-spring, Sparkle, bounced back in the news recently with an item in the *New Yorker,* which printed a letter from a young lady thanking her aunt for a Sparkle doll received at Christmas. "Dear Auntie Martha," the letter said. "Thank you so much for the doll. I am making a dress for her. I do not know when it will be finished. She is a super doll to hang out the window and torture." We suppose the long hair *is* pretty convenient for castigatory experiments, particularly scalping.

Gertie herself rated a mention not long ago when the U. S. Engineer's boat *Gouverneur* was renamed *Gravel Gertie* by her present owners, Material Service Corp. of Chicago. Any day now we expect to hear that someone has organized a B. O. Plenty for President Club.

Ubiquitous Concrete

OUR favorite clipping service sent us this cryptic item the other day: "Hogs fed on concrete



need 12 to 15 square feet per head." Wonder if that applies equally to big ones *and* little ones? You'd think a diet like that would make 'em a bit lethargic after a while, and that their space requirements would shrink somewhat.

Bowl Happy

WE thought the football impresarios had long ago introduced every imaginable kind of bowl game to pry admission fees out of the sports-happy American public, but a new one cropped up this year. The first Stone Bowl game in history was played behind the walls of Washington State Penitentiary at Walla Walla. It was a strictly

intramural affair, except that the referee, according to all reports, was "brought in from outside." It seems to us that the same designation would apply to the players, unless they were born there, but no doubt it was the intention to imply that the referee, unlike the players, was permitted to leave shortly after the game.

Anyway, he told the press it was the cleanest game he'd worked all season. We can't quite decide whether his observation is an indictment of college-level football, or an indication that our better state penitentiaries are failing to arouse in their undergraduates the kind of spirit that makes for mayhem on the gridiron.

Our Private War

WE'RE getting just a tiny bit irked over the multitude of releases by the overseas operating staff of the Office of Technical Services, purporting to show that the German precast concrete industry is 40 miles and a few odd hops ahead of the American industry. Maybe the ex-supermen *do* have us backed off the map, but the examples which have been cited so far have been anything but convincing.

The most recent blurb we've seen in this series has to do with the manufacture of pre-stressed, reinforced-concrete freight cars in a plant located at Heidelberg, Germany. In breathless wonder the item discloses that with the exception of wheels, springs and drawbars, *every* single part of these cars is made of concrete.

What we'd like to know is, what's so darned wonderful about that? They've been making Pullman seats of concrete in *this* country for half a century, more or less, and nobody thinks much about it except when he is actually sitting in one. We hear they're at last about to try using somewhat more resilient materials, no doubt because some wide-awake chap has noticed that the human posterior is composed of curves rather than planes. Anyhow, the point is that we were way ahead of the Germans.

British Austerity Note

WE are a bit intrigued by a recent news item from England reporting that Bruce Woodcock, heavyweight champion of Europe, is recovering from an eye injury sustained while he was working in a quarry near Leeds. Evidently the English don't support their prize-fighters in anything like the style we do. Here in the States it is conceivable that between fights a heavyweight champion might while away the time buying up a few quarries here and there just for the hell of it. But *work* in one? Never!

Sedentary Verse

ONE of our jauntier clipping services recently sent us this little gem, quoted from "Friendly Cheer," whatever *that* is:

Footprints on the sands of time
are not made by sitting down.

Apparently it was thought we'd treasure the item because sand was involved, but we're really much more beguiled by a question which "Friendly Cheer" leaves unanswered. What kind of prints *are* made on the sands of time by sitting down? Don't tell us, now! We want to work it out for ourselves.

Butane-Fueled Truck-Trailer Units Go into Service in Los Angeles

another ON THE SPOT report

THE sprawling Los Angeles metropolitan area receives its sand and gravel almost exclusively by motor trucks. In no other large city is the total movement of aggregates so closely tied up with highway transportation. At least 90 percent of the more than 1,000,000 tons produced monthly goes forward by trucks and trailers from the pits and plants in the San Gabriel and San Fernando Valleys.

By HARRY F. UTLEY

John D. Gregg, one of the important producers in the Roscoe area of the San Fernando Valley, is a nationally recognized authority on the design and development of production facilities, as has been pointed out in numerous past articles in PIT AND QUARRY. Too, he pioneered in developing the truck and trailer combination now widely used by Los Angeles County producers. Early this year he placed in service a fleet of five high-powered, high-capacity delivery units which represent another forward step in transportation efficiency.

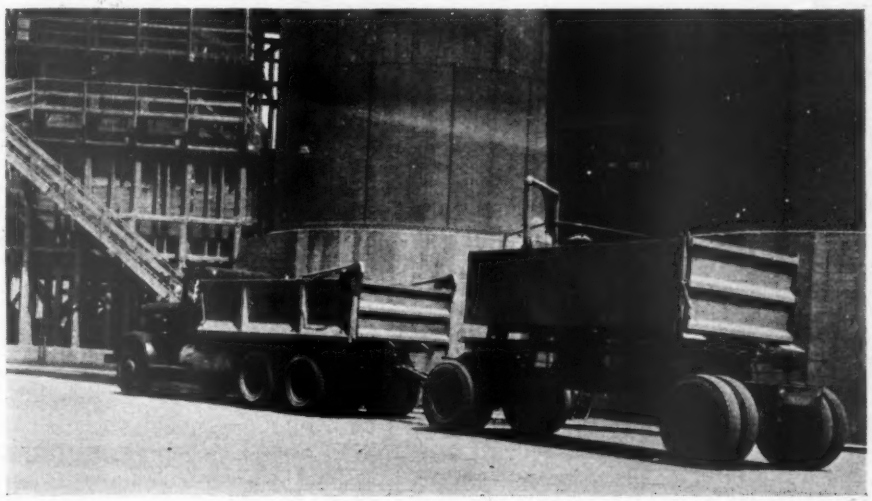
These new additions to the Gregg fleet are truck-telescopic trailer combinations of the type widely used in this area. Each carries a legal payload of 21 tons—9 tons in the dump-truck body and 12 tons in the trailer, the load being distributed over five axles and 18 tires of 11- by 20-in. size.

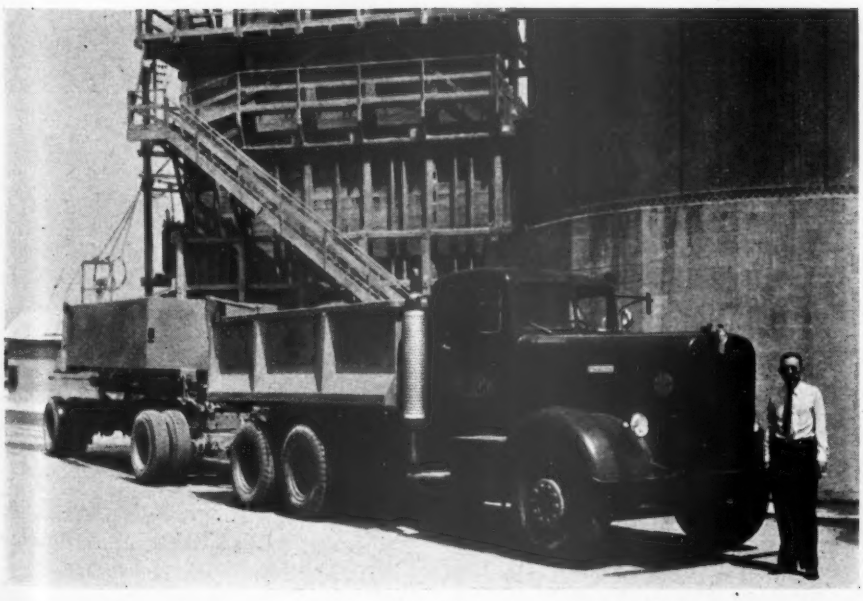
Power is supplied by Hall-Scott "400" engines using butane as fuel and developing well over 300 hp. The 6-cyl. engines have a 5¾-in. bore and 7-in. stroke—a piston displacement of 1090 cu. in. The choice of butane to fuel the huge engines resulted from tests made by the company with one of its other trucks which earlier had been converted from diesel fuel to butane. Considerably longer engine life is promised through the utilization of this fuel due to its clean burning qualities, freedom from dilution, etc. Exhaust gases are smoke and carbon-monoxide free, a feature of peculiar local importance in view of the agitation and pending legislation in Los Angeles which seeks to conquer an alarming "smog" and fume nuisance which has aroused the citizenry to action in recent months.

The new truck-trailers have ample power to enable them to move along with the normal flow of traffic without the necessity of too-high speeds between stops and slowdowns to maintain efficient average operating speeds.

Facilities for refueling are available to a limited extent in the Los Angeles area; however, the company is arranging to install its own butane fuel service at the plant garage.

The chassis of the new trucks were built and assembled by the Kenworth Motor Truck Co. of Seattle utilizing Gar Wood hoists on the dump bodies. Trailer chassis were supplied by Fruehauf and the patented sliding mountings and bodies were installed by the Likens Mfg. Co. of Los Angeles. Timken SW456 dual-drive axles transmit the power to the drive wheels.

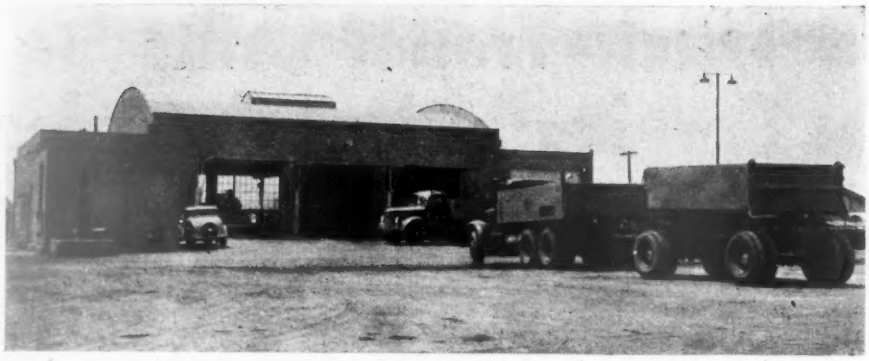




• Right: One of the John D. Gregg delivery units, seen from the rear to show how the transfer-type trailer body is mounted on roller wheels.

• Below: John H. Jackson, transportation superintendent, standing beside one of the new units to indicate the height of the radiator.

The operation of the sliding, telescopic trailer bodies is of interest, although they have been in use in one form or another for a number of years in Los Angeles. These units permit the hauling of a high-capacity load over the highways, yet provide the maneuverability required to dump in locations that would be inaccessible to a straight truck-trailer unit. Arriving at the job, the trailer is uncoupled and



• The garage and complete service shop of the company, where the fleet is maintained.

the truck-body load is discharged at the desired point. The empty truck then returns and backs up to the front end of the loaded trailer, a cable winch operated by a power take-off from the truck transmission pulling the loaded trailer body into the truck body and locking it snugly into position. The load may then be hoisted and dumped in the same manner as the truck-body itself.

The John D. Gregg plant has been in operation in its present location for the past 11 years. The first Gregg aggregates plant, however, was opened in Sycamore Canyon at Whittier, Calif., early in the present century by A. H. Gregg, father of Mr. Gregg. This was before the era of the motor truck, and 6-mile teams pulling wagons and wagon-trailers (probably the forerunner of the modern truck-trailer) moved the material to the job. This early Gregg plant was one of the first to be operated by power, a huge one-cylinder engine (fueled with natural gas) supplying the power which was transmitted by belts, pulleys and shafting. Ignition for the starting impulse was ingeniously provided by the flame of a match, it is recalled.

After completing his education, John D. Gregg assumed the management of his father's aggregate-production interests. The Sycamore Canyon deposit was shortly abandoned and Mr. Gregg designed and built, in 1927, the modern plant at Irwindale, Calif., which later was sold to the Consolidated Rock Products Co. of Los Angeles. It was at this plant that Mr. Gregg developed the truck-trailer combination from which the present-day models evolved.

The present Gregg truck-trailer fleet consists of 18 company-owned units while an additional 20 or more hired trucks are driver-owned and operated. The fleet is maintained and serviced in a modern garage on the plant property. Responsibility for the rolling stock rests with John H. Jackson, transportation superintendent, who has been with the organization for many years. Unit repair assemblies are always available in case of breakdown and, since the company strives for interchangeability of parts in all vehicles, it is possible to do a major repair job in a brief space of time. Spare differentials, transmissions, mounted tires, trailer tongues, etc., are readily available as a unit in case of failure on one of the trucks.

• The instrument panel in the cab of one of the trucks, with a tachograph recorder mounted on the cowling.

Each truck cab is equipped with a Sangamo Tachograph and the driver signs and turns in his chart daily. This chart provides a graphic record of the day's operation. It shows the time consumed on the trips, the maximum speeds attained, the starts, stops, and amount of idle time charged against the truck and the driver.

The location of each piece of equipment can be ascertained at a glance from the office of John Becker, chief dispatcher. A numbered tag corresponding to each truck is always hung on an appropriate hook on a tag board to indicate its whereabouts.

The job of Glenn Wonderlich, truck supervisor, is similar to that of a traveling engineer on a railroad. He spends much of his time riding the cabs with the drivers, educating the newer recruits, observing and offering suggestions to the more experienced drivers. Repairs are looked after by the shop foreman, Larry Lightfoot.

Drivers are trained to be courteous, to other motorists as well as to customers. Safety is stressed constantly and a "driver's dinner" is held frequently for group discussions on pertinent topics.

New N.C.S.A. Building

(*From page* 71)

4. A circular testing track for making simulated service behaviour tests on bituminous mixtures in order to determine their durability under wet conditions. The circular track is 14 ft. in mean diameter and the traffic equipment is driven from the center by means of a 3 h.p. motor. A rubber-tired wheel mounted at the end of a radial arm operates on the track and carries a load of about 2000 lb.

Crushing and Screening Equipment For making screening tests on both coarse and fine aggregates, the laboratory is equipped with a large "Ty-Lab" mechanical screen and a small "Ro-Tap" sieving machine for testing fine aggregates; likewise, a revolving screen made by the Hendrick Mfg. Co., after designs provided by the late W. S. Weston. A small "Hummer" vibrating screen is available for preparing large samples of coarse, or fine aggregate for use in concrete investigations.

A small crusher of the gyratory type and a small grinding machine are installed for the preparation of aggregates for concrete and bituminous concrete investigations.

For making the necessary measurements the laboratory is also provided with auxiliary equipment such as a whittemore strain gauge, used for measuring the gain in length of concrete which is affected in the freezing and thawing tests. Any appreciable gain in length indicates that unsoundness of the concrete is to be expected.

A testing bin for making load tests on flexible road surfaces is a portion of the equipment and this is used from time to time as problems present themselves. Soil pressure measuring equipment for determining subgrade pressures due to traffic loads is used in conjunction with the bin.

A.I.M.E. Convenes in New York for 166th General Meeting

By OLIVER BOWLES

another P and Q exclusive

THE American Institute of Mining and Metallurgical Engineers held its 166th general meeting in the Pennsylvania Hotel at New York City, February 15 to 19, 1948. As aforetime this great international organization, which covers all branches of mining, as well as the preparation of mineral products for market and use, held many sessions on diverse subjects. Most of them were highly technical, covering the newer developments and inventions in many fields. Obviously numerous activities such as those relating to metal mining, metallurgy, petroleum and coal are of only indirect interest to most readers of PIT AND QUARRY, and they are covered herein only in their broader implications.

During the past year the activities of the A.I.M.E. have been guided by President Clyde Williams, director of Battelle Memorial Institute, Columbus, O., but during the recent meeting he passed the gavel to the newly-elected president, Dr. W. E. Wrather, Director of the U. S. Geological Survey in Washington, D. C. The past year has been strenuous for those who are guiding the destiny of the institute, because the organization, which now has a membership in excess of 18,000, is undergoing certain growing pains which demand some degree of reorganization. A special committee which has made a study of the problem reported to the directors on February 15, and plans for some reorientation of functions are now in progress.

W. E. Wrather
Newly elected A.I.M.E. president

Dr. Oliver Bowles

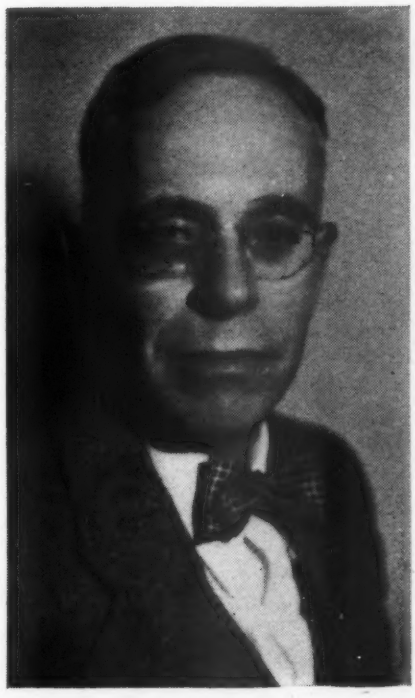
OUR FUEL OIL PROSPECTS

Certain of the broader aspects of this 5-day conference are of interest to everyone. It was pointed out at one of the Petroleum Division sessions that the recurrent regional shortages of fuel oil and gasoline, while occasioned superficially by transportation difficulties, basically are reflections of a rapidly-rising demand for petroleum products which has outstripped the expansion of production and refinery facilities. Normally the United States exports petroleum products in excess of imports of crude oil, but recently this country has become a net importer. It appears, therefore, that, for the time being at least, we are not self-sufficient in this vital product. It is estimated that by 1951 our national requirements of crude oil will reach 5,700,000 barrels per day, and that net imports will reach at least 110,000 barrels a day. This serious situation centers attention on the two primary sources of additional supplies, namely foreign oil fields, and the development of a synthetic fuel industry. Regarding the first of these sources, the Caribbean area is the most important foreign source, but the Middle East is attaining growing importance. It is predicted that it will produce at a rate of 820,000 barrels a day by 1951. This area will therefore become an important field from which supplementary supplies may be obtained.

A condition of self-sufficiency within our national boundaries is highly desirable, and the swelling of our petroleum supplies by manufacture of liquid fuels from oil shale, coal, or natural gas have, on this account, attained such interest that the Secretary of the Interior has recommended the inauguration at once of a nine billion dollar program of construction. The Bureau of Mines has been active for some years on a program of research pertaining to manufacture of liquid fuels from oil shale and coal. It is reassuring, therefore, to know that the problems of our household, industrial, and national defense requirements of these essential commodities are in the hands of competent industrialists and capable government agencies.

INDUSTRIAL AND NATIONAL SAFETY

A session of unusual interest to all mineral producers embraced a discussion of fundamental economic



R. W. Smith
Chairman, Industrial Minerals Division

problems. The program was arranged by E. W. Pehrson of the Bureau of Mines. Everyone is vitally interested in the adequacy of our mineral resources both for the maintenance of industrial activity and the preservation of national safety. Various phases of the current situation with respect to mineral supplies and reserves were discussed by such authorities as Dr. James Boyd, Director of the Bureau of Mines; Colonel G. A. Lincoln of the U. S. Military Academy, West Point, N. Y.; Andrew H. Phelps, vice-president of Westinghouse Electric Corp. and member of the National Mineral Advisory Council; Robert P. Koenig, chairman of the Mineral Resources Committee of the President's Committee on Foreign Aid; and Donald H. McLaughlin, president of the Homestake Mining Co. Following are some of the leading features of the discussion.

An important long-range policy of national defense is the stockpiling of those minerals that are essential to national safety, adequate supplies of which are not available from domestic sources. A second line of defense is the accumulation of complete information on our national mineral resources, and intelligent conservation of them. Such conservation is not to be interpreted as hoarding, but rather their efficient utilization. However, utilization should not be stimulated to the extent that it would tend to exhaust limited reserves. It was urged that artificial props such as subsidies to stimulate sub-marginal production are unwise as they generally lead to rigid control or government operation, trends which are contrary to our free-enterprise system.

There is urgent need of improved technique in many mineral-producing and fabricating industries in order to reduce costs, bring submarginal operations to a profitable stage, and assure more adequate domestic supplies. It was emphasized that mineral procurement policies should not be dictated by immediate selfish interest, but should be harmonized with broader concepts of national preservation and security. An important objective of the Marshall Plan for assistance to foreign nations is to encourage and help those nations to become self-supporting in minerals insofar as their resources will permit. It also envisages securing for the stockpile supplies of foreign strategic minerals in return for American aid. Other subjects discussed were tariffs, world sources of important minerals, and gold in its relation to inflation.

INDUSTRIAL MINERALS DIVISION

The papers of greatest immediate interest to readers of PIT AND QUARRY were those given at sessions sponsored by the Industrial Minerals Division, the activities of which have been guided during the past year by Chairman J. L. Gillson, geologist of the du Pont Company, Wilmington, Del. A new chairman, Richard W. Smith of the National Resources Department, United States Chamber of Commerce, took office during the meeting.

Although the division used many available papers for several successful regional meetings during the year, a program of unusual merit was provided for this New York meeting. The success of the convention was due in no small measure to the work of Prof. R. M. Foose of Franklin & Marshall College, Lebanon, Pa., chairman of the program committee.

MILLING PROBLEMS

One session held in cooperation with the Milling Methods Committee was devoted to problems of preparation of minerals for use. F. R. Milliken, manager of the National Lead Company's McIntyre mine at Tahawus, N. Y., described the process of recovery of ilmanite and magnetite from a complex ore. This mine supplied during the war the major part of the ilmanite needed for manufacture of titanium pigments, thus relieving a shortage occasioned by the difficulty of obtaining supplies from India. The demand for titanium pigments has grown enormously during recent years. An interesting by-product of the mill is a magnetite too high in titanium for metallurgical use which is used as an aggregate in making heavy concrete blocks for certain special applications.

A rock that has created considerable interest during the past 10 years is nepheline syenite, which is used as a constituent of white ware and glass. Although this rock has been found in a few localities in the United States, the largest and purest deposits are in Peterborough County, Ontario, Canada. These deposits furnish a product running as high as 24 percent alumina, which makes it a desirable constituent of glass, enamels and other ceramic products, replacing feldspar. An undesirable iron content of about 3½ percent is reduced to a fraction of one percent by magnetic separators. The rock is mined underground, but supplementary supplies are obtained from an open quarry during the summer. Grinding plants are operated at Lakefield, Ontario, and Rochester, N. Y. The Bureau of Mines at Ottawa is investigating the application of flotation for removal of undesirable corundum. Mine capacity is about 9,000 tons a month, and most of the product is used in the United States. The Canadian operations were described by C. J. Koenig of Ohio State University.

James Barr of Armour & Co., Chicago, Ill., described some interesting flotation experiments applied to the concentration of barite sludge. This is a difficult problem because the barite particles are very fine, most of them under 325-mesh. Flotation is less successful in barite, running less than 80 or 85 percent $BaSO_4$. Barite is used extensively in making heavy drilling muds to prevent blow-outs in oil wells. It is also used in making paint.

Bleaching clays are clarification agents of very great importance in the petroleum industry. They are used in two ways—the percolation method, whereby oil is pumped through a relatively-coarse granular clay, and the contact method, in which a batch of oil is in contact for a time with a mass of finely-divided clay. D. W. Ross and T. A. Klinefelter of the Bureau of Mines outlined simple tests which they had developed whereby bleaching clays may be identified and their bleaching qualities evaluated.

ELECTROSTATIC SEPARATION

Some combinations of minerals are not amenable to separation by the better-known methods. Differences in gravity may be too slight to permit gravity separation, the response may be too weak to apply magnetic separation, or the preferred particle size may be too large for successful use of froth flotation. In some such instances electrostatic separation has proved successful when applied to the minerals in their natural state. A paper presented by Foster Fraas and Oliver C. Ralston of the Bureau of Mines embodied some important improvements in the process developed by several years of laboratory study. This paper emphasized the fact that for most minerals a preliminary conditioning will greatly improve the electrostatic process.

For instance, when the process was applied to a mixture of sillimanite, quartz and biotite in their natural state, virtually no separation was accomplished. The material was then conditioned as follows: a minus 14- plus 65-mesh pulp was agitated for 20 minutes with 2.5 pounds of sulphuric acid and 0.25 pounds of

hydrofluoric acid per ton of feed. After washing and drying, the material was further treated with 1 pound per ton of benzoic acid. After conditioning in this way a sillimanite concentrate containing less than 5 percent quartz was obtained by the electrostatic method. By similar treatment a satisfactory kyanite concentrate was obtained from a mixture of kyanite, quartz, muscovite, and chlorite. Electrostatic treatment of this mixture without conditioning was unsuccessful.

When a mixture of kyanite, zircon, and quartz was conditioned with sulphuric acid alone, the quartz could be separated, but separation of the kyanite from the zircon was possible only when the mixture was treated further with benzoic acid. These examples illustrate the potential importance of improved electrostatic methods in obtaining concentrates of commercial value from seemingly useless mixtures of nonmetallic minerals.

MINING GEOLOGY

One session was held jointly with the Mining Geology Committee.

The peculiar soapy mineral, pyrophyllite, a twin brother of talc and used in much the same way, is mined chiefly in North Carolina, but Robert C. Stephenson, assistant state geologist of Pennsylvania, described an interesting occurrence in Adams County, Pa. The pyrophyllite occurs in rhyolite rocks on South Mountain, 12 miles from Dillsboro. A small-scale operation is planned. The product will probably be suitable only for insecticide use.

Cherts are sometimes regarded as undesirable constituents in crushed stone aggregates, because the weakness or failure of some concretes have been attributed to the unsoundness of cherty aggregate. Prof. A. T. Allen of the geology department, Emory University, Ga., presented a discussion of the origin of chert in the Kingsport limestone formation at Mascot, Tenn. A further study of its physical characteristics and resistance to weathering is desirable.

DRILLING AND BLASTING

A session of the Mining Methods Committee on drilling and blasting pertained primarily to metal mining, but the methods and equipment described are applicable in some degree to any type of underground mining. L. S. Chabot Jr. of the Tennessee Coal, Iron and Railroad Co. described diamond-drill blasthole stoping in the Book Mine, Menominee, Mich. The use of diamond drills in underground metallic ore mining has become standard practice in several localities, particularly in Canada. Their use has extended little into the field of nonmetallic mining, chiefly because in general the rocks are softer and are drilled with relative ease using steel or hard alloy drill bits. It may be well however, for nonmetallic miners to follow this newer practice with some care, for it may offer advantages that are not immediately apparent. It was found that the diamond drill operated satisfactorily in a hard hematite ore and was adaptable to almost any type of drilling plan, whether horizontal, vertical, or at any intermediate angle. The drill itself (with diamonds at $8.50 per carat) was the principal item of expense, 37 percent of the total drilling cost. Recent tests with tungsten carbide (Kennametal) insert bits are very promising as they have reduced the cost per foot of drill hole chargable to the drill bit from 67 cents for diamond drills to only 4 cents for the Kennametal bits. More complete information may be obtained from Tech. Pub. 2305, obtainable from the secretary of the institute, 29 W. 39th Street, New York City 18.

A paper presented by John W. Koster of the duPont Co. on drill patterns pertained to magnetite mining, and therefore had no direct bearing on nonmetallic mining; nevertheless, some of the points emphasized are worthy of consideration by soft-rock miners. There is a growing use of tungsten carbide bits, and as the holes are smaller than when steel bits are used, more holes may be necessary. Present carbide bits are 1½ inches in diameter, but there is a movement toward the use of larger bits in order to give more space for the explosive with fewer holes. It was emphasized that all holes should be blown before loading to clear out cuttings and water. Cap and fuse are generally used, but electric instantaneous and delay caps are also employed.

The new oil-shale mine at Rifle, Colo., operated by the Bureau of Mines, serves two important purposes: (1) it furnishes oil shale for the extensive program of research on recovery of liquid fuels from it; and (2) it provides a laboratory for research on mining methods. Two phases of the latter function were presented at the New York meeting.

Tell Ertl and E. E. Burgh of the Bureau of Mines outlined certain practices and select methods for mining oil-shale at low cost. Tests were made to determine drilling efficiency. The bits used were 2⅛-in. size faced with borium (boron carbide). Horizontal drill holes were driven in the lower adit of the oil shale mine. The tests proved (1) that the speed of drilling varies directly with the coarseness of the cuttings produced, and (2) that the speed of drilling is limited by the energy output of the drill. It is evident, therefore, that drilling speeds can be increased by (1) improving the design of rock bits to produce coarser cuttings and to permit ready removal of the cuttings, and (2) by using rock drills with greater energy output.

F. D. Wright of the Bureau of Mines and P. B. Bucky of Columbia University presented another phase of the experimental work which was a determination of the safe width of span the stone would stand and the minimum size of pillars required to support overlying formations. Samples of the oil shale were submitted to Columbia University, where tests were made of crushing and shear strength and other factors. The stone was placed under stresses on a model scale which would simulate conditions in the mine. The results indicated that, with a factor of safety of 4, a room would stand safely unsupported for a span of 100 feet. Curves were developed showing minimum pillar size for various depths of overburden. Discussion of the paper brought out the fact that a test room in the mine at Rifle, Colo., 100 feet long and 70 feet wide has been standing 1½ years with no sign of weakening of the roof. This circumstance corroborates the results of the laboratory tests. The significance of this paper to prospective underground operators is its indication of the feasibility of determining safety limits in span and size of pillars by laboratory experiments before mining is begun, thus avoiding costly cut-and-try methods.

MINERAL COMMODITIES

At two general sessions of the Industrial Minerals Division a group of papers were presented on diverse mineral commodities that are not widely known, but some of which are of unusual importance, both in peace and war.

Quartz Crystal Hugh R. Waesche, geologist of the Signal Corps Engineering Laboratories discussed the importance and application of piezo-electric quartz. To the layman this subject may appear to be unimportant, but it was emphasized that thin plates of quartz suitable for electronic frequency control were essential to communication equipment on every plane, tank, ship or even walkie-talkie used during the recent war. Other devices are pos-

sible but are very inefficient. Only three other minerals—tourmaline, nepheline, and berlinite are said to have properties similar to those of quartz, but they are unsatisfactory or unobtainable. Certain crystallized salts may also be used but they have serious limitations. We are dependent virtually 100 percent on this one substance—natural quartz crystal, and the requirements for use are so exacting that scarcely any of the quartz crystals obtained up to this time in the United States can be used. Almost all of the suitable material originates in Brazil. Anyone who finds crystals of clear quartz is urged to send samples to the Signal Corps Laboratories at Ft. Monmouth, N. J. A domestic source of supply is urgently needed.

Asbestos Asbestos is a mineral of wide industrial use, particularly for heat insulation, fireproof building materials, and friction products for use on automotive equipment. For many of these uses substitution of other materials is difficult or impossible. At present the situation with respect to available supplies of this important mineral is critical throughout the world, even for a peacetime economy. There has been a notable lack of discovery of new deposits, and known deposits are being depleted at an increasing and even an alarming rate because of a great expansion in established applications and the development of new uses. The general situation together with a discussion of present mining and milling methods was presented by Michael J. Messel, manager of Vermont Asbestos Mines, Eden, Vt., the only large asbestos operation in the United States. He pointed out that a growing demand for short fibers has led to the establishment of plants for re-treating the extensive dump piles in the Quebec asbestos area. Vermont Asbestos Mines is building a new modern mill to treat its fiber-bearing rock. Special machinery is required because asbestos milling is unique in several respects. The basic principle is to separate fiber from rock with minimum damage to the fiber. As the United States produces only 4 to 6 percent of its requirements there is urgent need of prospecting to locate new deposits. Asbestos occurs in serpentine, and, although geophysical prospecting may be used to locate serpentine, it is of no help in identifying those extremely rare deposits that contain marketable fiber. The only large deposits found within our borders were discovered purely by accident. In the interest of national welfare active prospecting for both asbestos and quartz crystal is highly desirable.

Carbon Carbon compounds are very common in nature in the form of coal, petroleum, gas, and wood, but Raymond B. Ladoo, nonmetallic mineral consultant of Newton, Mass., pointed out that the element carbon in relatively pure form is an important industrial mineral. Natural forms of carbon are the well-known minerals graphite and diamond. Synthetic or manufactured carbon is prepared for industrial use from coal, petroleum, gas, or wood. Its chief source is petroleum coke. Large quantities derived from the latter source are used in making electrodes. Carbon exists in various forms that are characteristic, and are not easily or even possibly interchangeable.

CEMENT INDUSTRY OF JAPAN

G. Richards Gwinn of the U. S. Bureau of Mines, who recently spent six months in Japan, gave a brief review of the portland cement industry of that country. Cement is one of the few things in which Japan is self-sufficient. Peak production reached in 1940 amounted to over 6,000,000 metric tons, or about 36,000,000 barrels. In 1945 eleven companies operated 36 plants. The equipment suffered little war damage, but the plants were greatly in need of repair at the end of the war. Five types of cement are made—ordinary, high-early-strength, silica, slag, and nonconstructive. The latter is a low-grade type suitable only for floors and plastering. When the plants are repaired it is expected that the industry will have a monthly capacity of 375,000 metric tons, approximately 2,250,000 barrels.

ILLINOIS LIMESTONE SOUNDNESS TESTS

Soundness is an important quality of aggregates used in road and building construction, but the requirements are even more exacting for stone to be used in water filtration. J. E. Lamar of the Illinois Geological Survey discussed tests made of Illinois limestones to determine their suitability for filter stone. Freezing and thawing tests are good indicators of soundness, but the sodium sulphate test is more rapid because one cycle with sodium sulphate is equivalent to ten cycles of freezing and thawing. Limestones were not regarded as suitable for filter use unless they withstood at least 20 cycles of the sodium sulphate test. Failure may appear in the form of granulation, chipping, or spalling.

The following relationships between soundness and physical properties are significant. All the limestones that passed this severe test were medium-to-fine-grained. Failure of the coarse-grained stones was by granulation, and of the medium-grained by chipping or splitting. Some fine-grained lithographic limestones failed by chipping or spalling. Some oolitic and fossiliferous limestones passed the test, but those with a chalky matrix failed. Most of the visibly crystalline solid stones passed. Chemical purity has little effect on soundness, but if incipient fractures are present the stone will fail. Clay in seams will accelerate splitting. Some stones with silt or sand in the matrix were satisfactory. Organic matter is not harmful. Cherty limestones are generally unsound. There is no connection between color and soundness. Favorable properties are denseness, a uniform fine-to-medium grain, absence of seams and cracks, and a clear resonant sound when struck with a hammer. These tests present criteria of broad application.

OKLAHOMA AND THE PACIFIC NORTHWEST

W. B. Mather of the Midwest Resources Institute outlined the results of a study devoted to the nonmetallic mineral resources of 15 counties in southwestern Oklahoma. About 87 percent of the mineral production of Oklahoma consists of petroleum products, and if the state is to be industrialized, its nonmetallic mineral resources must be developed. To this end the electric power companies sponsored this study. The principal resources are building and monumental granite, feldspar, limestone, vein calcite suitable for glass making, dolomite for refractories, wool rock, clays and shales, gypsum, salt, barite, and volcanic ash.

To most readers the list of minerals is less important than the implication of the study: that *nonmetallics are the backbone of industrial activity.* This was further emphasized by a paper presented by Richard J. Anderson which embodied similar studies in the Pacific Northwest undertaken by Battelle Memorial Institute. This paper was devoted to new developments only, which included among other things a new plant for making silicon carbide abrasives, a new plant in Idaho to treat barite-bearing rock by flotation, and the proposed project of the Aluminum Company of America to utilize ferruginous bauxite in northwest Oregon. Enlargement of a cement plant at Seattle by the Permanente Cement Co. is forecast.

How Aggregate Producers Can Finance Purchases of Equipment

By E. T. Neville
Vice President and National Sales Director,
C. I. T. Corporation

Cost of Necessary Replacements Can Be Spread Over Extended Periods

another P and Q exclusive

OVER the past months many associations and trade papers have made surveys of business conditions existing in the various fields they serve. These reports are all in general agreement on one point — that the construction industry is headed for an all-time high in dollar and production volume. And that the aggregate industry will play an important part in this program is conceded by all.

Available reports indicate that producers of the essential materials on which contractors in every field depend so heavily are unable to keep up with orders for cement, stone, sand, gravel and other much-needed aggregates. This situation is largely caused by the physical inability of pit and quarry operators to produce the necessary quotas and is related to the limited amount of up-to-date machinery and equipment that is available to operate at maximum capacity.

The very nature of this business is such that the excavating, loading and handling of aggregates exacts a heavy toll from all types of machinery. There is probably no other business where the wear and tear on equipment is greater and in which machinery and equipment becomes obsolete at a faster rate.

During the stress of war years repairs and replacements were extremely difficult. Now manufacturers of aggregate-producing and handling equipment are catching up with their backlog of standing orders and producers can see the day ahead when their worn-out equipment can be replaced with modern, labor-saving machines.

If producers are to keep up with the demand for their products, it is a self-evident fact that they must either maintain or bring up to date the equipment needed to reduce handling costs and produce maximum quantities of aggregates. Don't overlook the fact that alert producers everywhere are aware of this situation and that to keep pace with competition the use of modern machinery is a "must."

The list of such equipment is long; each individual producer should judge his own requirements and, to the limit of his ability and resources, make immediate plans to acquire every piece of machinery and every mechanical aid necessary to bring his particular project up to peak capacity and thereby reap the benefit of existing profit-making opportunities.

If all the machinery needed were immediately available, this advice would quickly solve all production difficulties, were it not for one important factor—*money* with which to complete the purchases. The acquisition of modern machinery and equipment calls for the investment of substantial amounts, oftentimes more than a producer can afford to divert or withdraw from his working capital.

However, any concern that can afford to make a moderate initial investment and whose prospects warrant the acquisition of good machinery, need not hesitate to embark on a re-equipment program because, under today's modern financing methods, a purchaser of equipment can spread the major portion of the cost over extended periods. Financing is available for expansion or replacement programs. To illustrate how an aggregate producer spreads the cost of purchasing production equipment, let's trace briefly the steps which must be taken to arrange a time payment transaction.

The purchaser in question represents any aggregate producer faced with the problem of replacing equipment. We start with the premise that he is prepared to make a moderate down payment but wishes to conserve his working funds by paying the balance out of income. For example, he negotiates with a manufacturer or a distributor for the purchase of machinery and equipment. Just what items make up this total are unimportant because we are dealing only with the actual financing of the unpaid balance.

After the buyer has established his financial responsibility and has reached an agreement on price, warranties, delivery, etc., there remains a decision as to how the unpaid balance should be financed. The buyer can apply directly to a financing organization for a term loan to cover the amount needed or he can request installment terms from the distributor or manufacturer in order to spread this amount over an extended period.

In either case, the end result would be the same; the buyer has sought and can obtain ample time in which to amortize the purchase through a series of monthly instalment payments arranged in amounts to suit his business needs.

All that then remains is the actual delivery of the equipment and when this is made the buyer executes the documents necessary to validate the purchase. The financing company then furnishes the funds necessary to complete the purchase and the obligation is retired through the agreed series of monthly payments.

Let's assume that credit has been approved for a purchase amounting to $60,000. The buyer makes an initial investment of 25 percent and extends payment of 75 percent of the purchase over several months. Therefore, with a cash outlay of only $15,000 and a series of monthly payments arranged in amounts to suit his needs, he acquires machinery and equipment that starts to pay for itself immediately out of increased efficiency, operating savings and greater production capacity. A charge for this credit accommodation, based on the number of months required to liquidate the obligation, is paid by the purchaser.

Many different case histories could be used to illustrate how aggregate producers have financed their equipment purchases. An excellent example of how two different concerns used the facilities of a financial organization to advantage are found in the following instances. These two companies both needed additional equipment but felt that it was desirable to pay for it out of income. The results of their foresight speak for themselves.

To modernize their quarry, which was badly in need of modern equipment, company A wanted to buy two loaders, a shovel-crane-dragline, crusher, screens and a portable conveyor. The equipment would cost $100,000 and was to be purchased through three different distributors. Initial payments aggregating $25,-

(*Continued on page* 86)

New Plant of Victorville Lime Rock Co. Makes Finely-Ground Products

another ON THE SPOT report

THE Victorville Lime Rock Co., a subsidiary of C. K. Williams & Co., nationally-known producer of iron-oxide pigments and miscellaneous nonmetallic-mineral fillers, recently completed construction of a modern and attractive new plant at Victorville, Calif. Unlike the former plant established 20 years ago on the same site, and dismantled to make room for the new operation, the new plant produces only finely-ground limestone which is in great demand by the paint, rubber, flooring, paper and plastic industries throughout the west.

Of steel and concrete construction, the new Victorville plant is located on the Mojave River in Victorville and is served by the Santa Fe and Union Pacific railroads. It was designed by company engineers and is a compact, highly-efficient operation which is meeting the expectations of its designers to the fullest extent.

The raw material used is a relatively soft and extremely white calcitic limestone which has a brightness of 95 to 98 percent compared with pure magnesium oxide. The stone has a desirable low silica content, a typical analysis running as follows:

SiO_2	0.17	percent
Fe_2O_3	0.035	percent
Al_2O_3	0.17	percent
CaO	56.00	percent
MgO	0.05	percent
Loss on ignition	43.45	percent

The deposit is located about 4 miles from the Victorville plant on the fringe of the Mojave Desert and covers 600 acres. After blasting, the rock is loaded by a ½-cu.-yd. Bucyrus Erie shovel into dump trucks for delivery to the plant. There are five Ford and Chevrolet trucks in the fleet and each can carry about 8 tons per trip.

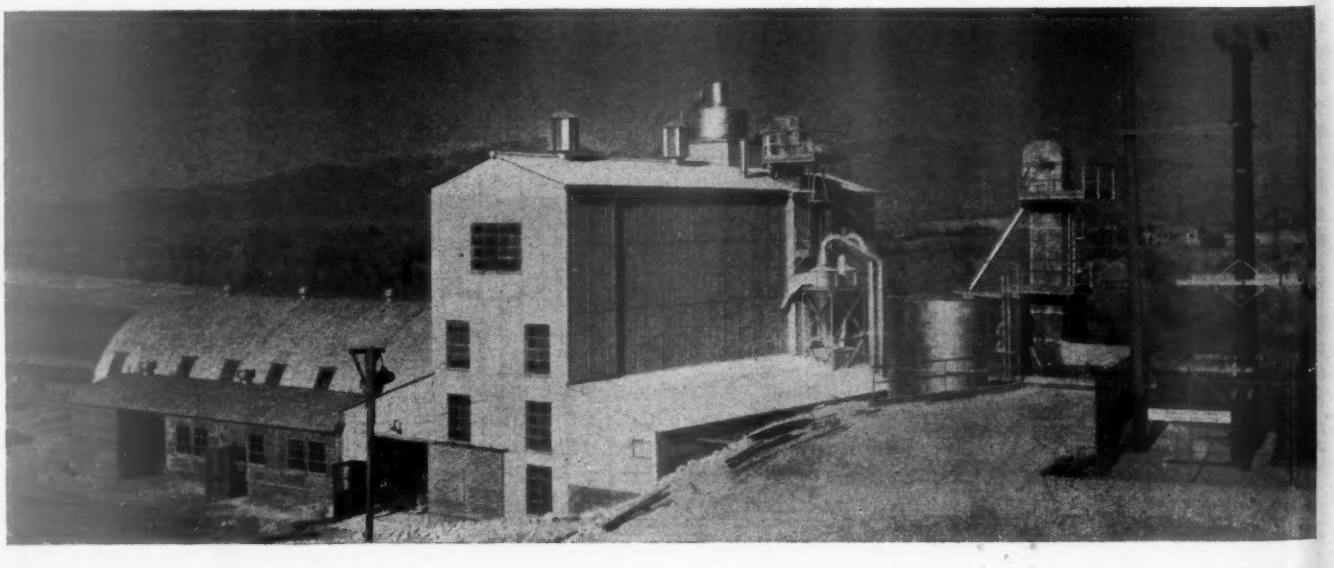
By HARRY F. UTLEY

Arriving at the plant, the trucks ascend an earthen ramp with concrete retaining walls and dump into a steel crusher feed hopper, any oversize being sledged through grizzly bars, spaced 14 inches apart, which span the hopper opening. The hopper feeds an all-purpose jaw crusher, a 15- by 30-in. Kue-Ken Simplex unit, via a gravity chute in which rail "fingers" are suspended to retard the movement of the rock. With a steady feed, the crusher can produce about 60 tons of stone (broken down to 2-in. size and smaller) per hour. It is driven, through V-belts, by a 40-hp. motor. Were an ordinary jaw crusher used, the 40-hp. motor could scarcely supply the power required to obtain breakage at this rate; however, this new-type crusher is so efficient that it actually requires no more than 20 or 25 hp. at full load, the 40-hp. unit having been installed merely because it was readily available when the new plant was being equipped. Because of the peculiar structure of the stone, the material breaks down during crushing into prism-like particles.

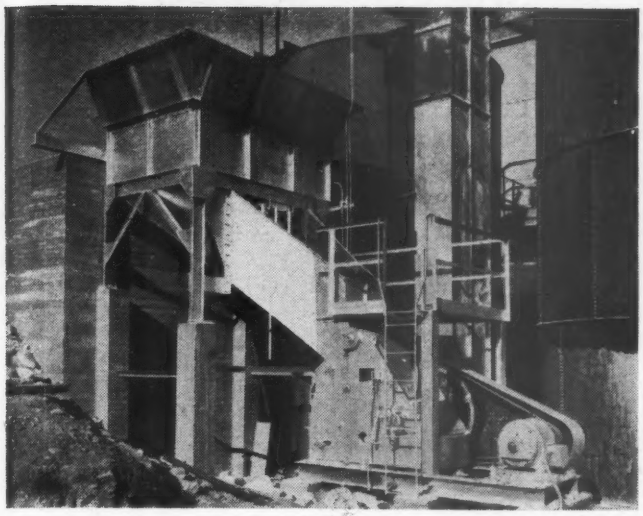
An enclosed bucket elevator raises the crushed material to two steel storage silos, each of which has a capacity of about 120 tons. Gates at the bottom of the two silos discharge to a common apron feeder supplying another bucket elevator which feeds the stone to a Williams No. 1 hammermill. This mill further reduces the lime rock to ⅛-in. minus, the mill product being elevated to a pair of 80-ton steel bins which serve to feed the two pulverizing units, a Raymond high-side, Whizzer-equipped roller mill and an 8- by 20-ft. Hardinge pebble mill.

The finely-ground stone, product of the two mills, is manufactured in a wide variety of sizes to suit the needs and specifications of each purchaser. The finest material, minus 15 microns, is a pebble-mill product, the mill being in closed circuit with a system of air separators, and sizing is closely controlled. Both cyclone and bag-type collectors are employed to capture dust. Considering the fineness of the material produced, the new Victorville plant is one of the cleanest of its type ever observed by this writer, little or no atmospheric dust having been apparent when the plant was visited. There is a well-equipped laboratory on the premises and frequent samples are taken for analysis to assure uniformity of prod-

(*Continued on page* 94)



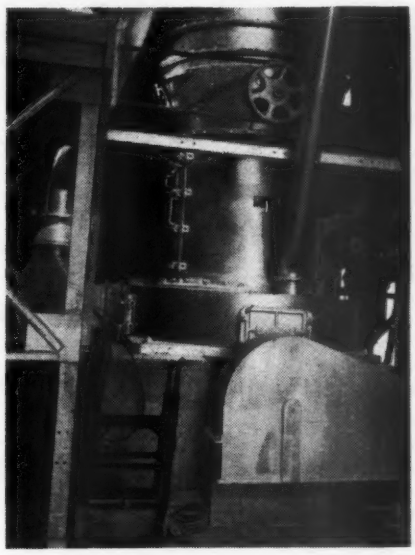
• The new plant of the Victorville Lime Rock Company on the Mojave River in Victorville, Calif.



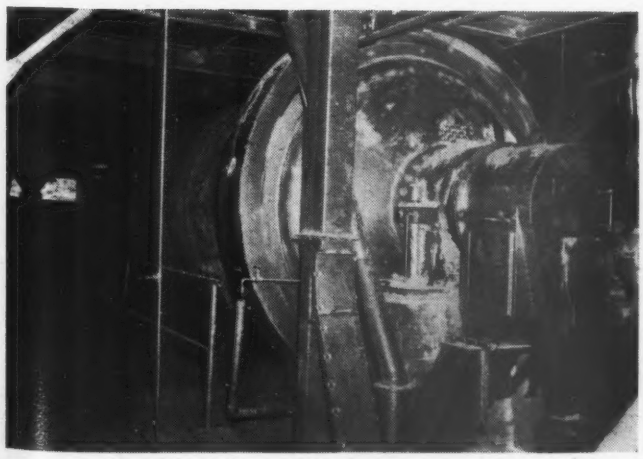
• The crusher which breaks down the quarry-run rock to 2-in. minus. The feed hopper (left), elevator and storage bins are also shown.

• The quonset-type warehouse, with the roller mill in the far background. In the foreground are stacks of filled and empty bags.

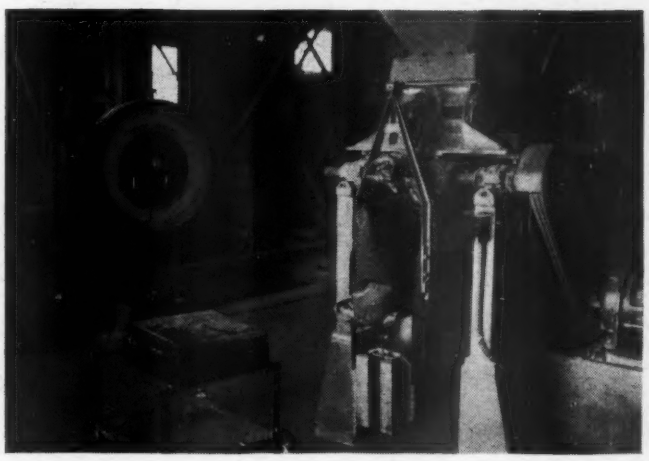
• Secondary crushing of the rock is handled by this hammermill, which reduces it to 1/8-in. minus. The material is elevated to bins which feed the pulverizing units.



• A closeup view of one of the two pulverizing units, a high-side roller mill.

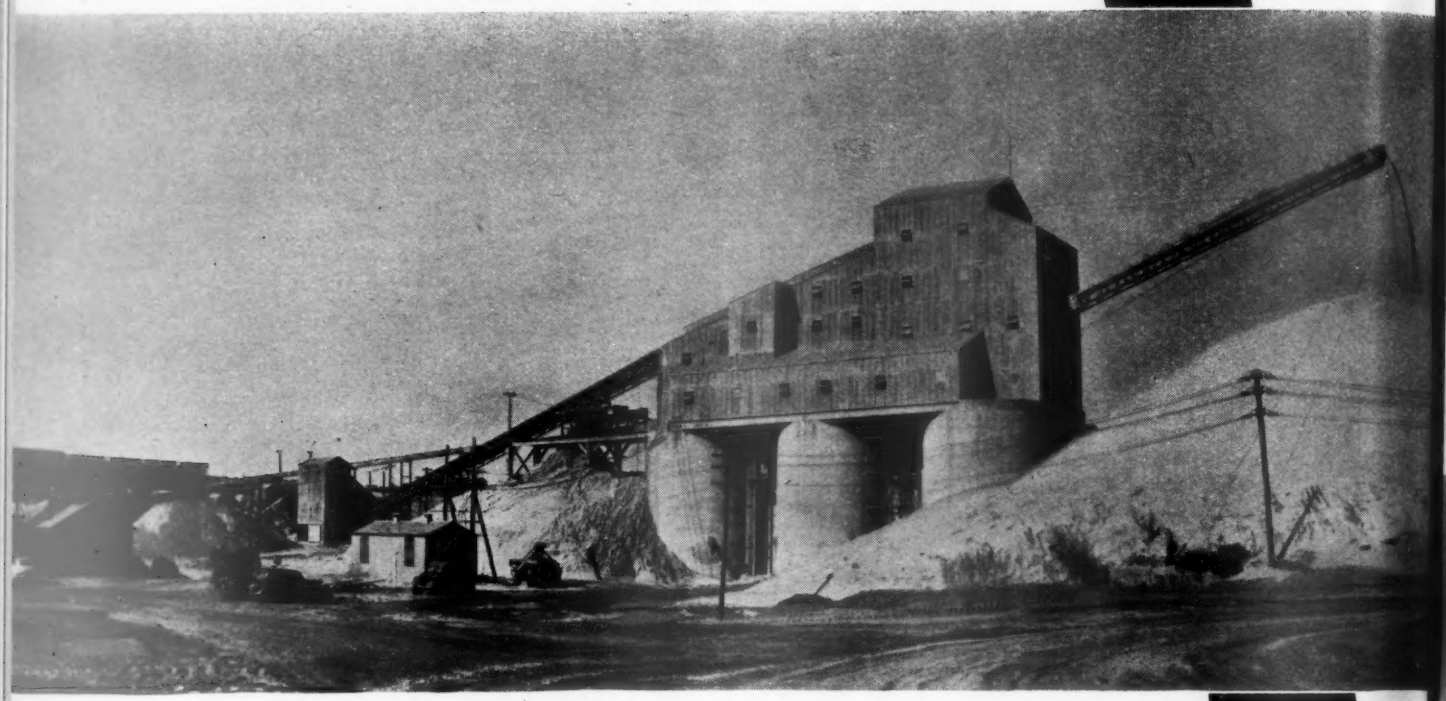


• The 8- by 20-foot pebble mill which grinds the finest product, used by the paint, rubber, flooring, paper and plastics industries.



• One of the two one-spout packers (right) and the platform scale for checking weights (left).

● The Port Washington screening and washing plant of the Metropolitan Sand & Gravel Corporation on Long Island, N. Y. At left is a train of cars discharging their load from the pit to the 5,000-cu. yd. raw storage pile. The plant silos and the storage pile at right have a combined storage capacity of 165,000 cu. yd. of finished products. A tunnel belt conveyor under the storage reclaims for scow loading.



NEW AGGREGATE DISTRIBUTING SYSTEM SERVES NEW YORK AREA

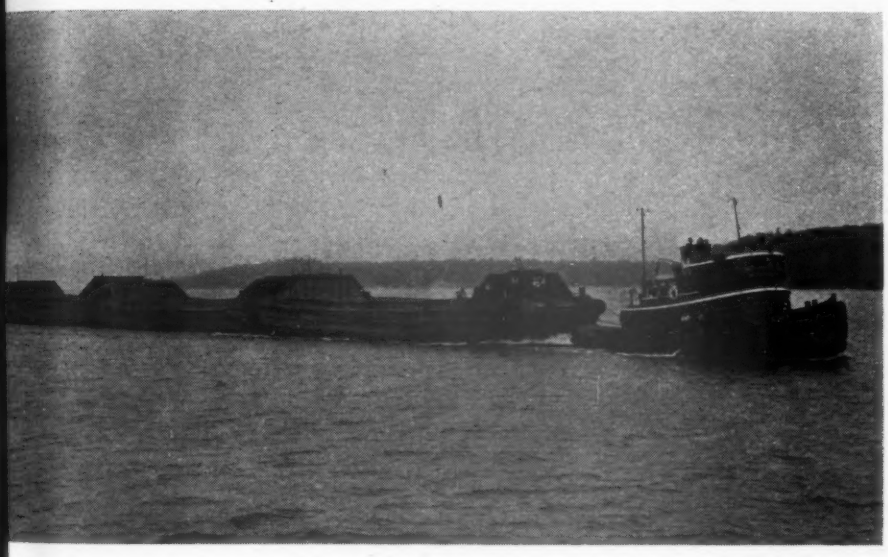
By Walter E. Trauffer

Metropolitan Sand and Gravel Corporation delivers by water from Long Island plants to distributing terminals

LATE in 1947 the Metropolitan Sand & Gravel Corp., Port Washington, L. I., N. Y., completed the last major step of a 5-year modernization and expansion program which makes it possible for this company to deliver sand and gravel efficiently and economically by water to the entire New York metropolitan area. This included the construction of three shore distributing plants at strategic

points—in the Bronx and at Flushing and Greenpoint on Long Island—which are now all completed and in full operation. Sand and gravel are delivered to these points from the company's producing plants at Port Washington and Northport, L. I. A complete description of the general plan was published in the June, 1946, issue of PIT AND QUARRY following a visit by the writer to all these points shortly after construction on the new terminals was begun.

The map on page 54, the same one used with the earlier article, shows how these materials were to be delivered in deck scows to these terminals and to dealers' docks in New York City and at New Jersey and Connecticut shore points. The company was to remain essentially a wholesaler and the terminals were to be used to deliver bulk and dry-batched aggregates and ready-mixed concrete to retailers f.o.b. their trucks. There has been no alteration in this general plan except that changes in the ready-mixed-concrete production setup in New York City have made it necessary for the company to become, in a limited area, a retailer of concrete and to some extent a retailer of aggregates. From 60 to 70 percent of the sand and gravel output goes to dealers in sections of metropolitan New York outside New York City. This trade will be continued and improved.



• The company's No. 2 tug, which is powered by a 650-hp. diesel engine. It is shown towing back empty from one of the terminals to one of the stoke collecting points four of the sixty-eight 800-ton deck scows used by the company for the delivery of its products. Another similar tugboat helps in this service.

History

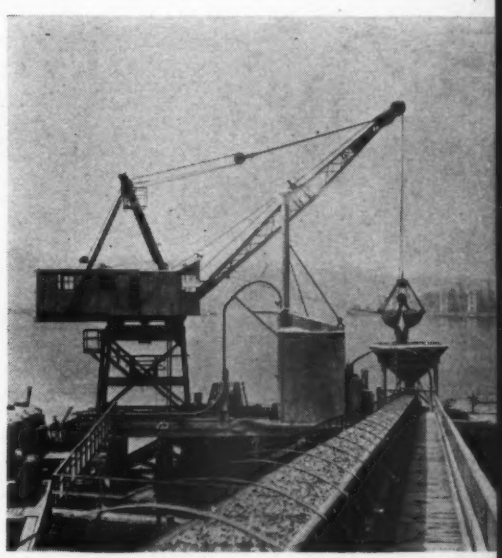
The history of the Metropolitan Sand and Gravel Corporation goes back to 1918, when its predecessor company, the Goodwin-Gallagher Sand and Gravel Corporation, began producing "Cow Bay Sand" at Port Washington, Long Island.

In 1941 the company decided to revamp its whole set-up and the two gravel plants were rebuilt in 1942 as the first step in the program. Then in 1943 H. F. Garvin Pelsue, now president, was appointed vice-president and general manager. Mr. Pelsue had for 21 years been with Graham Bros., Inc., Los Angeles, Calif., one of the largest aggregates producers on the West Coast, the last 10 years as vice-president.

The first step in the program was the construction of the new sand and gravel plant at Port Washington, which went into operation in July, 1942. A smaller plant at Northport was completed in March, 1943. The war then interrupted this program but it was resumed as soon as possible after peace was declared.

Construction of the Bronx ter-

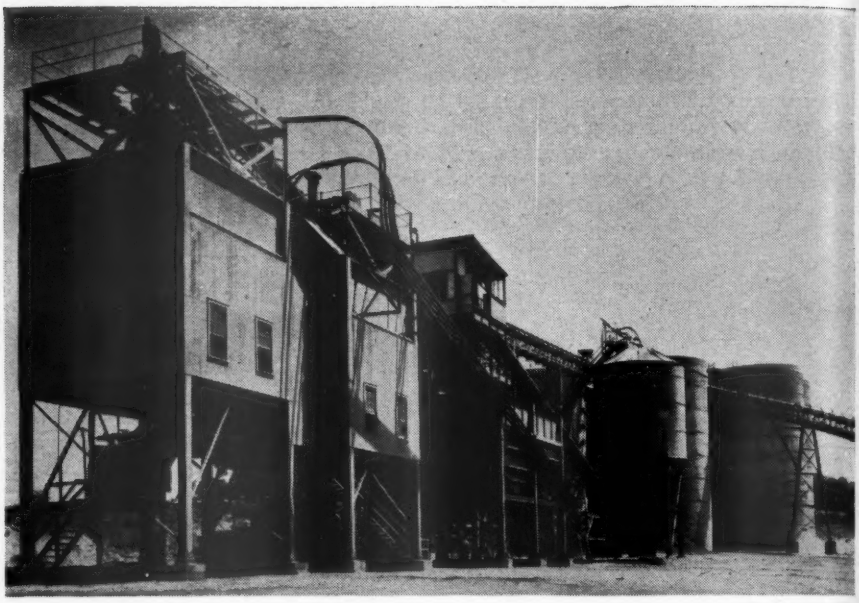
• An aerial view of the Bronx terminal, completed in November, 1946, which is identical in basic layout to the firm's two other distribution terminals. At left are four aggregate scows being unloaded. Shown are the belt conveyors and the pump line which convey aggregates and cement to the shore plant.



• The electric whirley with a 2½-yard clamshell at the Bronx terminal unloading from scows to a belt conveyor. Cement is unloaded from l.c.l. containers and scows at left to the tank on the dock.

minal was begun early in 1946 and it was completed in November of that year. The Greenpoint terminal was completed in June, 1947, and the Flushing terminal in September, 1947. A floating ready-mixed concrete batching plant went into operation in July, 1947. On January 1, 1948, the company had on hand ready to go forty 5½-cu. yd. truck mixers and ten 10-cu. yd. dump trucks. It also has six tugboats and 68 deck scows of 800-ton capacity each. Now under construction is a truck maintenance and repair garage at Flushing.

This entire system was based on the company's decision to meet the growing demand for aggregates in this area by using present delivery equipment more effectively to bring its capacity up to that of the producing plants. Careful study showed that by providing improved terminal facilities the capacity of its existing fleet could be doubled. Three sites were selected which are within 3 miles of 75 percent of the aggregate market in the New York area.



• A view at the Bronx terminal, showing storage silos, service bins, and two batch plants (foreground).

• A map showing the system for water delivery of sand and gravel to the New York Metropolitan area from the Long Island plants. Stake points 1 and 2 are shown.

Water Transportation

The shuttle system of scows as described in the earlier article has worked out as planned. Up to 20 loaded scows are towed at one time from the producing plants to Stake 2, off La Guardia Field, as shown on the map. The No. 1 tug usually used for this run is powered by an 805-hp. Fairbanks-Morse diesel engine. From this point from 4 to 6 scows are delivered to each of the three terminals. The remaining scows are then towed to Stake 1, from which they are towed to New Jersey and Hudson River points. This towing is done by two smaller tugboats, one powered by a new 650-hp. Busch-Sulzer diesel engine. Three small tugboats are used for plant service.

Through an arrangement with the Callanan Road Improvement Co., South Bethlehem, N. Y., crushed stone is brought in scows from that company's plant at Kingston, N. Y., down the Hudson River to Stake 1. The tug which brings down the loaded sand and gravel scows hauls the empty ones and some of the loaded stone scows on its return trip, delivering the latter as it picks up empties at the terminals. This method eliminates much cross-hauling of the empty scows.

Terminals

The three terminals are basically identical in design, the only differences being those made necessary by the topography. Each has dock facilities for from 4 to 6 loaded scows and the same number of empties. Each has a minimum of 12 feet of water at low tide and any future

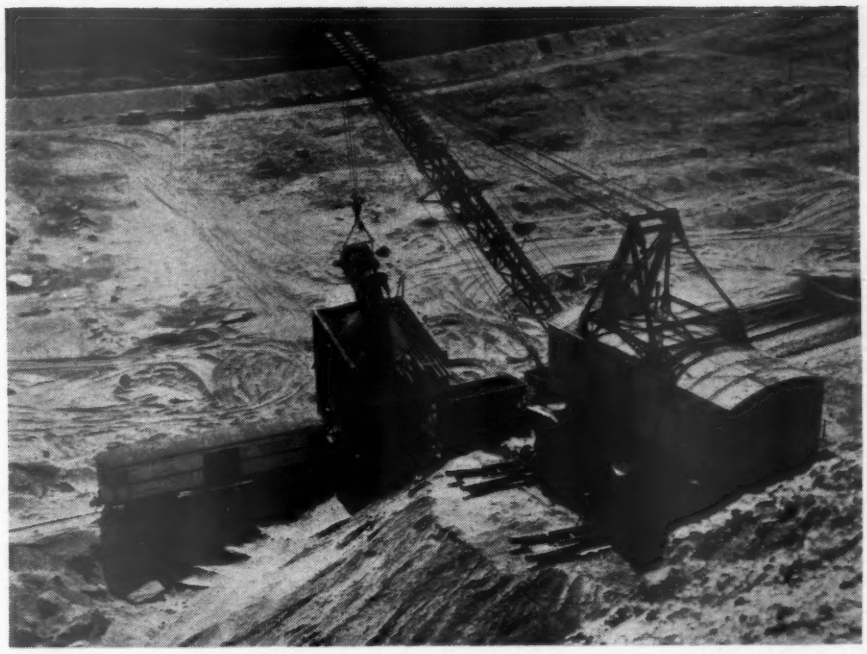
developments, such as self-unloading boats, are provided for. An important difference is that the Bronx terminal has 9 concrete storage silos, and the others have 10. Each terminal is capable of doing 1,500 cu. yd. of concrete proportioning daily. All belt conveyors have Kennedy-Van Saun idlers.

At each terminal cement is delivered in 1.c.l. containers on scows. From the containers it is pumped to a 100-bbl. holding tank on the dock. An automatic Kennedy-Van Saun air-transport system conveys the cement (from 350 to 500 feet at the different terminals) to a 7,000-bbl. concrete silo and a 2,000-bbl., 2-compartment C. S. Johnson steel tank. A Robinson pneumatic conveying system feeds from this tank to the two 200-bbl. cement storage compartments of each of the two Butler batching plants at each terminal, while a Fuller-Kinyon pump moves the cement from the silo to the service bins.

At the Bronx terminal the aggregates are unloaded from the scows by a Clyde electric whirley with a 2½-cu. yd. clamshell bucket. A Lambert electric whirley on the pier is used at Flushing; and aggregate unloading at Greenpoint is done with a Marion electric clamshell crane. At each plant the aggregates are carried on a 30-in. belt conveyor from the dock hoppers to a second conveyor to the center of the circle of 1,000-cu. yd. capacity concrete storage silos (9 at the Bronx plant and 10 at the other two). From this conveyor the aggregates are discharged on a 40-ft. radial conveyor from which it can be discharged either into the silos or between and beyond them to ground storage when the silos are full. There is also a third alternative to be described. The silos have outside openings near ground level so that trucks can be loaded direct by means of bucket loaders.

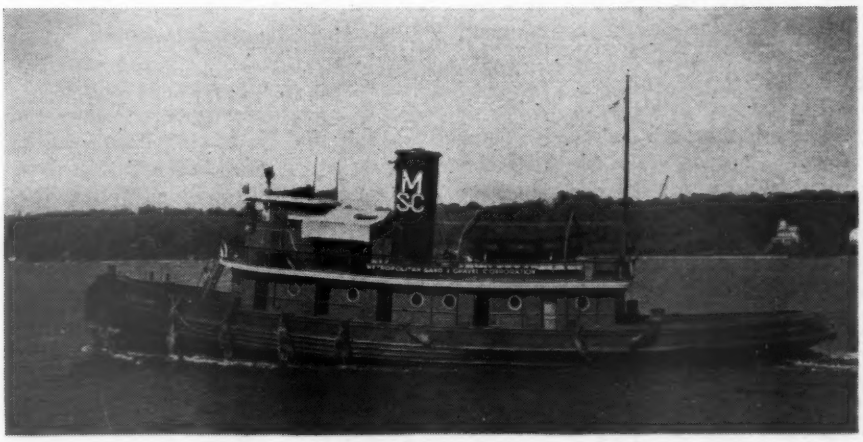
Ground-level openings in the silos on the inside of the circle allow the materials to be withdrawn as desired by a second radial conveyor. An inclined conveyor feeds to four 150-cu. yd. bins which are used to load dump trucks. Material can also be brought here direct from the scows by discharging from the radial storage conveyor to a small hopper over another conveyor to these bins.

The aggregates can also be bypassed from these bin conveyors to another pair of conveyors which feed eight 50-cu. yd. aggregate compartments of two 6-compartment Butler batching plants. One plant has a 2½-cu. yd. Butler weigh



• Mining operations at Port Washington, where an electric dragline loads four 35-yard cars in 4 minutes. The hopper is moved by mounting it on a car.

• Northport pit operation, showing a 3½-yard bucket working at the 80-foot face.



• The No. 1 tug, powered by an 805-hp. diesel engine. No. 1 can tow 20 loaded scows in a flotilla. The firm has three delivery tugs and three plant service craft.

batcher and is used either for loading out loose material for dry batching into batch trucks or for loading mixer trucks. The other plant has a 6-cu. yd. batcher and is used for loading ready-mixed concrete truck mixers.

The Bronx and Greenpoint plants each have two 400-c.f.m. Chicago Pneumatic air compressors. The Flushing plant has a 500-c.f.m. Gardner-Denver and a 365-c.f.m. Jaeger compressor, each driven by a Caterpillar diesel engine. Hot water is produced at each terminal by a Preferred Utilities automatic boiler rated at 125 hp. at 15-lb. pressure and capable of heating 4,000 gal. of water per hour to a temperature of 180 deg. F.

Retail Deliveries

It has been mentioned that the company, in order to meet changing conditions, has had to deviate somewhat from its original intention to do only wholesaling. It now operates a fleet of 50 trucks. This includes 30 Jaeger 5½-cu. yd. "Hi-Dump" truck mixers, 10 Chain-Belt Rex 5½-cu. yd. horizontal-type truck mixers, and 10 Heil 10-cu. yd. dump bodies. These are mounted on 30 Mack and 20 Autocar truck chassis, all gasoline powered.

Gravel Plants

It is not the intention to describe the two sand and gravel plants operated by the company in any detail in this article as these were amply publicized when built. The Port Washington plant, when completed in June, 1942, replaced an old plant at that location which has since been torn down.

The old plant at Northport was rebuilt in 1943. Both plants are bank operations.

The Port Washington plant is located on a 728-acre property on Hempstead Bay on the north shore of Long Island, 25 miles by water from Manhattan. During this period 55,000,000 cu. yd. of material have been removed from this deposit. Material is loaded by a Bucyrus-Erie electric dragline with a 94-ft. boom and a 7½-cu. yd. Yaun bucket. This deposits the material into a 160-cu. yd. receiving hopper which is moved by lifting with hydraulic jacks mounted on a car. This hopper loads four 35-cu. yd. ore cars in three minutes. A sloping grizzly rejects oversize. A diesel-electric locomotive with two 250-hp. Cummins diesel engines hauls the train about ¾ mile to a trestle at the plant where the material is discharged on a 5,000-cu. yd. raw storage pile.

The plant makes eight products and has a finished storage capacity of 165,000 cu. yd. Reclamation through a tunnel on a belt conveyor makes possible any desired blending of sizes. Scows are loaded direct by the 36-in. by 800-ft. belt conveyor from storage. An 800-ton scow can be loaded in 40 minutes.

At the Northport pit a Marion electric crawler dragline with a 3½-cu. yd. Owens bucket loads material into a movable hopper. A series of 36-in. belt conveyors carries the material to the plant. The finished products are stored over a reclaiming tunnel from which they are reclaimed and loaded into scows by belt conveyors. Loading of scows is done in a small company-owned bay off Long Island Sound.

Miscellaneous

The company operates its own shipyard at Port Washington, where all marine repair and maintenance work is done. The equipment includes a 500-ton Crandall marine railway capable of hauling any company-owned floating unit.

The officers of the Metropolitan Sand & Gravel Co. are: H. F. Garvin Pelsue, president; L. L. Phelps, vice president; J. P. Leonard, treasurer. Eugene D. Boylston is assistant to the president; Howard Marsh is general superintendent; and George A. Reeves is sales manager.

Mr. Pelsue made the general layout of the new system and of the terminals and the floating plant. The detailed design and construction, including the designing and fabricating of the conveyor systems, were also carried out under his supervision. The company's forces did all the construction except the plumbing and electrical work, the building of the docks, and the dredging of the channels to them.

Financing Purchases

(*From page* 79)

000 could be made without handicapping operations; the problem then was how to handle the balance. A financial organization was consulted and an arrangement quickly made to consolidate *all* purchases in one obligation. The unpaid balance was then spread over several months and liquidated through a series of monthly installments.

In both cases the purchasers were able to obtain the new equipment they needed by making only moderate initial investments. Financing was quickly arranged for each concern which enabled them to retire the obligation over periods of time suited to their individual needs.

The financing also enabled the distributors to sell more equipment and, at the same time, obtain cash for their product. They, too, benefited because by turning these time payment transactions into immediate cash sales, they kept their working capital liquid. Such typical transactions are numerous throughout the aggregate industry and tend to show that it is feasible for producers and distributors alike to benefit through installment purchases, regardless of the amount involved.

Experience has shown producers that it is sound business procedure to borrow the necessary money to purchase machinery and equipment and pay for it out of income. All standard makes of machinery and equipment are eligible and financing organizations specializing in such transactions will handle all necessary details. Or, the suppliers from whom such purchases are made will make the arrangement upon request.

Aggregate producers should not overlook the fact that heavy demands are constantly being made on their cash resources for payrolls, supplies, taxes, insurance and many other items that have to be met from day to day. In order to take advantage of all buying opportunities, maintain a strong operating position and earn extra profits, ready cash is essential and heavy inroads against these funds should be avoided.

By retiring the obligation through a series of payments, the installment purchaser eliminates the necessity of refinancing or meeting top-heavy maturities at any time. Once credit relations have been established with either a financing organization, a manufacturer or a distributor, it is usually a simple matter to arrange on short notice for the purchase of additional equipment on a deferred payment basis. When opportunities arise (which they frequently do) to purchase desirable machinery, the deal can be concluded promptly and the buyer will obtain any advantage of price or delivery which accrues.

It is important to take good care of the equipment needed to work pits and quarries most effectively. It should not be allowed to deteriorate to a point where it operates at only partial efficiency. By keeping all mechanical aids up to date and in good working condition and by planning a long-range financing program to meet the cost of replacements, you have the formula by which a concern can produce maximum quantities of aggregates and at the same time earn maximum profits year in year out in bad times as well as good.

Some Lessons a Sampler May Learn From Concrete Coarse Aggregates-II

another P&Q exclusive

By ERNST W. GREINER

AS to the method of obtaining samples from the screens and chutes, there is probably no practical ideal one, because the discharge from screens is not always readily accessible or suited to the method the sampler would like to use. As is generally known, samples from flows should consist of numerous cross-sectional portions thereof. It should be observed here that perhaps worse than a poor system of sampling is a slovenly-operated good system. A handy tool is a trough of about 12-gauge steel (Fig. 4) several times wider than the largest pieces to be sampled, deep enough (usually 4 to 6 in.) to prevent pieces once in from bouncing out, and long enough to reach through the full thickness of the flow. The handle to be attached to this trough may be of any design or fastened in any way to permit the proper execution of the cross-sectional stroke through the flow. Either or both ends of the trough may be closed, as may seem best to serve the purpose of the tool.

The handling of the sampling trough calls for some comments. The sampling stroke should begin at the right or left edge of the flow, cut through the flow at right angles to the face, and go out of the flow at the other edge. More specifically: (a) The trough should be got into position for the stroke not by going *into* the extreme edge of the flow, but past it; (b) the trough should be maintained at right angles to the face throughout the stroke (Fig. 5), not swung on the arc of a circle; (c) the speed of the trough should be uniform—the operator using a little more muscle as the load gets heavier at the other side; (d) the trough should pass as close as possible to the end of the chute—to reduce the muscular effort in absorbing the momentum of the impact of the flowing material and to reduce the likelihood of loss due to the front-to-back spreading of the flow after leaving the chute; (e) the trough should not be *pulled* out of the other side while still in the flow, but should cut clear through the flow before being drawn out. The cautions with respect to the first and last movements are especially important. The pushing in or pulling out of the trough, while in the edge of the flow, increases the ratio in the trough of such segregated sizes as may occur at the edges of the flow. If the chute is 2 feet wide and 1 foot of the trough length is pushed through the flow at one side, and pulled through 1 foot of flow at the other side, it is readily seen that the sample neither begins nor ends as a cross-sectional portion of the flow. It's a pail-filling drag, not a sampling stroke. The individual stroke winnings can be dumped into a vessel until enough portions have been taken to make a proper sample of the kind expected to be taken. Back-and-forth strokes are not recommended as they do not lend themselves readily to well-controlled rhythm of movement.

The foregoing details may seem superfluous in an article to be read by people most of whom are conversant with such matters. But it is recalled that several years ago a well-known engineer and plant operator illustrated his cross-sectional sampling by having himself photographed doing this with an ordinary round-pointed shovel so held as not even to receive the full thickness of the flow, and so full that the sliding of the material off of the shovel was plainly visible. It was a good picture—of what *not* to do.

With the experiences of surges and recessions in the flow in mind, the sampler learns to watch the rhythm of his strokes. His intervals of catch may fall on surge or on recession quite unintentionally—but repeated too often, the rhythm of the strokes may be just as unfavorable to a representative sample as properly-spaced strokes would be favorable. In fact, it may be found advantageous to have several containers to receive the portions taken on full- and scant-flow alternations. The number of passes for each lot, along with the weight and grading of each lot, will constitute valuable data for later calculations—data that could not be obtained merely from

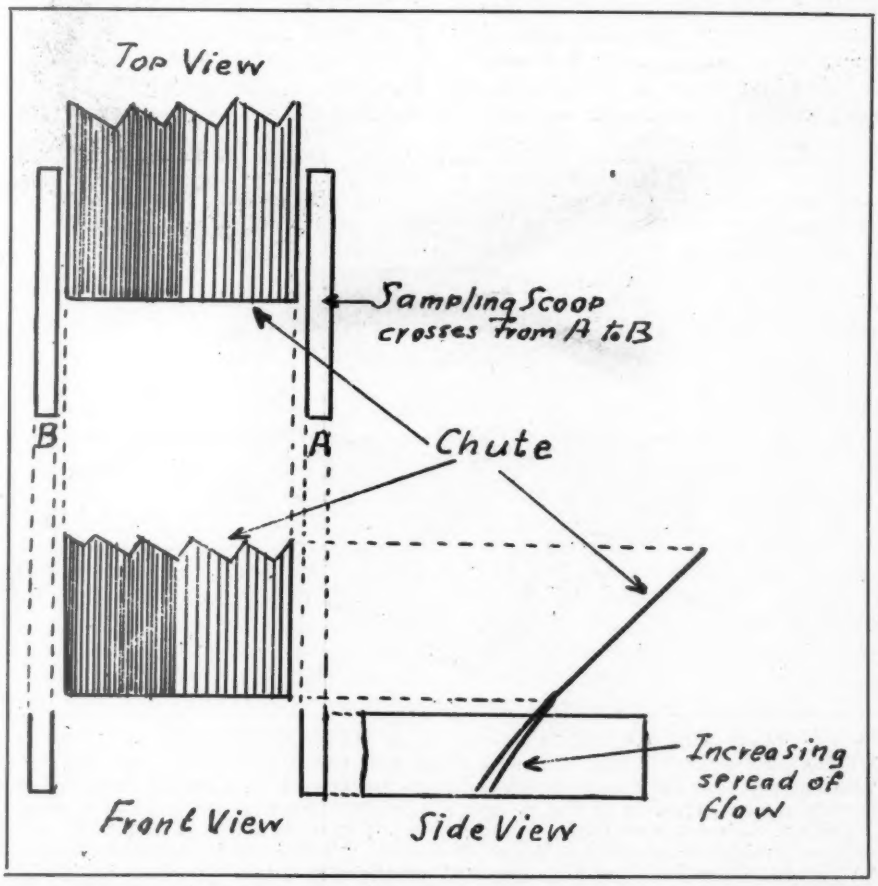


Fig. 4. The sampling scoop is thrust to position A of Top View, so that the flow will be received as shown in Side View. The scoop crosses the flow to position B, from which it is withdrawn and emptied. The scoop should be as close as possible to the edge of the chute, as shown in Front and Side views.

the grading of those portions combined by dropping them from the sampling scoop into one container.

So far as the *aggregate made* is concerned, we may assume that the sampler is satisfied and has assured his employer that the specifications have been met. But unless special attention has been given the subject, the sampler cannot assure the employer that the cars have been loaded so that the *consumer's* sampler will in all probability get a sample that will represent the average grading of the product. The risk is two-fold. There may be segregation for the reasons already discussed, and the consumer's sampler may exaggerate in his sample the apparent excessive coarseness or fineness—and still honestly follow the rules. He tries to do right, but mistakes guesses for judgment. In whatever way the cars may have been loaded, the *aggregate received* must be inspected for compliance with the specifications set. If the consumer's sampler tries merely to get a sample that will pass the car (or sometimes reject the car), or if he is indifferent to what kind of sample he gets, his job is easy.

Let now the *producer's* sampler be translated and changed by a kind of soul-transmigration into the personality of the *consumer's* sampler. He is no more sampling what is being prepared for sale; but what is being bought for use—to build a road that is not to crack, or a wall that is not to buckle, or a bridge span that is not to sag. The construction engineer has specified a grading of concrete aggregates, and the consumer's sampler must pass judgment on what the producer's sampler has permitted to be shipped.

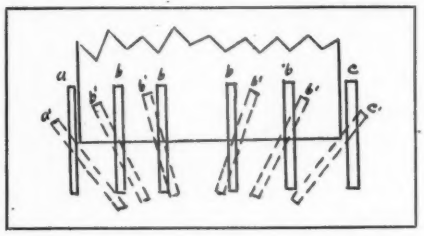


Fig. 5. (a) Correct position of sampling scoop for starting to cross the flow; (b) correct position of sampling scoop crossing the flow; (c) correct position of sampling scoop at the end of the stroke; (a'), (b') and (c') incorrect handling of scoop.

Give this sampler the benefit of "pretranslation" sampling experience and say he has forgotten all about former relationships and remembers only what he knows about sampling. Let's assume a railroad car shipment is to be inspected and the transmigrated sampler climbs over the end of the car. He sees perhaps three or four slightly-domed piles. Like the pile in the bin earlier presented to his view when he was a producer's sampler, each one of these piles shows surface variations practically coincidental with the four sides of the car, and a kick of the foot will show that the central portion of the pile is distinctly different from the sides.

A close examination of the piles will disclose whether the piles were made by material flowing vertically out of a bin or by being discharged from a chute sloping either crosswise or lengthwise of the car. He knows, accordingly, what the probable segregations in sizes within a pile will be, and he sets himself about the job of determining the probable master mix of the segregated areas lying about him, and coming from the discharge from a chute or bin the flow conditions of which he can visualize.

The standard instructions tell him to dig three or more trenches, the bottom of the trenches to be a foot wide and level, and to terminate a foot below the surface at the sides of the car. How deep? Just try digging a trench like that! A crane with a clamshell bucket may do it for him, but generally that big tool is not available. To add to his troubles, the trenches are to be dug "at points which appear on the surface to be representative of the material." Remember, our soul-transmigrated sampler hasn't forgotten what he learned as a production sampler. He knows that if he goes across the middle of the pile, he will probably get a finer sample than he did from the discharge chute at the plant. If he goes through the junction of two piles, the sample is apt to be coarser than his previous chute samples. That's what he learned in comparing various "bin" samples with chute samples. And now he is expected to pick points visually that "appear" to be representative of the material (a la specifications), dig trenches there—and forget that he knows that there is probably coarser stone or finer stone at one side or the other of the trench.

This ditch digging is a back-breaking business, whether done by the sampler or by "laborers." Of course, if the stone is just shoved endwise, as is frequently done, the gaps at the ends of the trench (i.e. at the sides of the car) get filled up and a shallow trench across the middle of the pile results in a car-width trench bottom from which the sample may be taken. But most of the stone between the original pile and the sides of the car is the stone of the displaced trench material. Unless actual covering of improper material was done purposely in loading, the sampler knows that he might as well have sampled that end stone without shoveling it out to the side of the car. If samples are taken by scooping up the sides of the trench

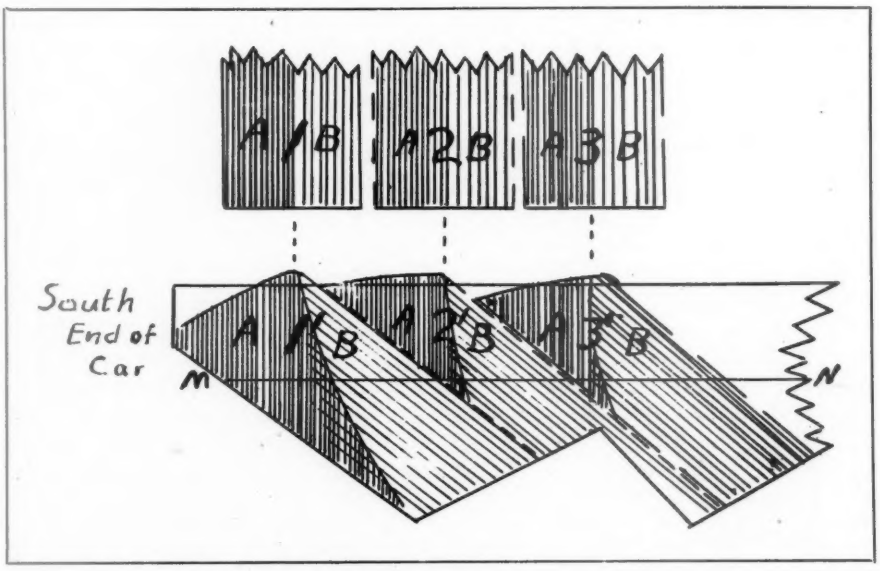


Fig. 6. (1) Position of chute with reference to south end of car while aggregate for Pile 1 is being run into car. (2) Position of chute (south end) after car is shifted southward to receive aggregate for Pile 2'. (3) Position of chute (south end) after car has been shifted again to receive aggregate for Pile 3'. (A) Side of chute and piles carrying finer grading. (B) Side of chute and piles carrying coarser grading. (Note: As before, "finer grading" and "coarser grading" do not imply all fine or all coarse.) (1') First pile in south end of chute. "A" predominates above line MN, while "B" predominates below. (2) Second pile. "A" and "B" again predominate respectively above and below MN. Below MN, 2'B is almost continuous with 1'B (3') Third pile. Repeats conditions of Pile 2'. (Note: Predominance of "A" above MN makes grading there finer than below MN. "B" likewise produces coarser grading below MN than above.

(perhaps in addition to bottom portions), as some prefer to do, the sloping sides will be found to have accumulated considerable finer-sized material as the shoveling proceeded. The remedy lies in "scooping" the trench to the desired depth with right strokes and then with left strokes of the shovel so as to give the finer sizes no chance to travel down while a shovelful, mostly of coarser sizes, is worked onto the shovel preparatory to casting it out of the trench. In any case the sampler knows that a shovel on which some of the larger pieces won't stay when it is pried and lifted out of the bottom of the trench and from off which some of the remaining larger pieces may roll while the smaller pieces stay lodged on the rounded load is not going to give more than a guess at the grading, although that guess may be within the specifications. A shovel in a trench is a poor substitute for a trough at the edge of a chute. The sampler tries to be fair, makes adjustments, finally gets his pails filled and hopes his guiding genius has made his errors of no effect.

The foregoing dilemmas presented to the mind of our sampler are not imagined for the sake of magnifying difficulties, but are presented as reasons why irregularities of mix, whether due to the movement of aggregates in chutes or to their separative lodging in the cars, should be corrected at the source. If so done, the consumer would have no necessity or excuse for resorting to such a method as the foregoing of selecting a portion of the carload and calling it a sample. What is accordingly called for is not particularly a method of *sampling* coarse aggregate, but a standard method of *loading* a car, truck, or barge that would prevent the segregations our painstaking sampler has encountered.

Let us suppose another car the sampler is directed to inspect presents a comb lengthwise of the car. Usually this consists of 10 to 20 successive mounds (Fig. 6) indicating the successive shifts of the car during loading. Digging a trench across such a comb to a depth of one foot below the surface where the aggregate comes in contact with the sides of the car is too impracticable to be done, especially when cars at the destination must be handled expeditiously. But the plant-trained sampler (now translated to the consumer's interests) knows that, no matter how deep he digs the trench, he can get a sample like that obtained at the production plant only by chance—not because he does something right.

If the car was filled by the flow from a chute, and if the discharging edge of the chute was parallel to the length of the car, and the south end of the car was loaded first, the sampler knows the top of the pile at the south end represents what was on the south side of the chute. What was on the north side of the chute has continuously fallen onto the long slope into the south hopper of the car. With the completion of the initial pile the car was moved possibly two or three feet and the new comb was brought to the level of the first section of comb. What fell off the north half of the chute again made a layer on the long slope into the hopper. So the procedure went on till the car was loaded, the last stone staying on top of the comb at each move being the stone from the south side of the chute.

In the sampler's "pre-experience" he learned that when such a procedure is followed, the comb, for the conditions given above, is predominantly of the grading presented by the material coming from the south side of the chute—in this instance, let us say, finer than that on the north. By the same token, the material that has continuously gone down the long slope into the car is predominantly of the grading presented by the material on the north side of the chute—that is, coarser than that on the south. Or, were a steel sheet to be passed horizontally through the car at about half the depth from the comb to the pockets, the material above the sheet would, under the supposed conditions, be finer than that below. If the same car had been loaded from north to south, the conditions in the load would be just the reverse of the foregoing, i.e., the coarser stone would form the comb while the finer stone would be found below. In either case the mass ultimately taken for a sample might grade within the specifications of the order and might even be representative of the *upper half* of the car. But if the sampler's skepticism should lead him to take a pailful from each carpocket when it is opened, the producer might have a hurried call of complaint on the grounds of vertical segregation in the car.

If the hypothetical consumer's sampler knows that the cars discussed above were loaded from a bin holding a part of, or more than, a carload, he hunts for the earmarks of segregation he knows existed in the bin. These are many times almost as evident in a car as in the bin. Coarse areas have their counterpart in fine areas elsewhere in the pile, regardless of whether the material comes directly from the screen chute or from a bin. Concrete coarse aggregates don't readily remix. If the coarser portion of the product is once segregated in a bin, say, on the east side, it will also be found on the east side of the car. The direction in which the door at the bottom of the bin opens will affect the shape of the volume which the coarse material will make in the pile on the car; but it won't make it remix with the material from the other side of the bin. A shovel penetrating numerous points on the surface of the car-pile finds the same variations the sampler's shovel earlier found in the bin. The consumer's sampler with the producer's sampler's experience knows that taking shovelfuls by any kind of spotting system is largely a chance, so far as the grading of the portions taken being representative of the pile in the car is concerned.

Attention is here called to a sampling procedure the consumer's sampler not infrequently must be witness to when a supervising inspector tries to take a sample from the bins at the batching scales. Two bins may be back to back, feeding into the container of the automatic batch scales just below the bins. The feeding shaft to the batch holder from each bin flares out at the top into a sizable hopper, the bottom of which slopes away from the top of the down shaft in three directions. The conveyor belt carrying the coarse aggregate to the bin may so discharge its load that the finer sizes drop more nearly over the shaft, while the coarser sizes are scattered away from the shaft. Also it may happen that the coarser side of the belt will discharge to the south half of the hopper, while the finer side discharges to the north side of the hopper. While the inspector is getting a portion of what comes down to the scales to be weighed, our well-schooled consumer's sampler knows it's no use to grit his teeth or to pray. He has learned that when the hopper is full, whatever is in or directly over the shaft, coarse or fine, comes down first. As the shaft area is lowered, the rest of the surface area begins to flow in, and the outer coarser portion flows in last. He can only calmly hope for gambler's luck that the inspector won't catch the worst segregation in the bin.

This segregation of either coarse or fine sizes is not chargeable neces-

sarily to the shipper. It is made at the batching plant and is directly chargeable to the bin-filling mechanism and procedure, and may occur with a shipment ideally mixed at the producing plant. The sampler's job is, of course, primarily to *sample;* but, as at the plant, if he is attentive to getting a proper sample, he will see that such conditions as are unfavorable to good sampling are unfavorable to obtaining ideally-mixed aggregate for making consecutively uniform batches of concrete. If he acquaints his superiors with his observations, corrective measures may be instituted, or he may hear, "That's the way those things are built."

That raises in the mind of our inquiring producing-plant-and-consuming - plant - experienced sampler the question "What can be done to insure that properly-graded stone once made is shipped and handled so as to retain the original uniformity of grading?" If it is properly produced, properly loaded for transportation and properly handled later, samples could be taken almost any time and anywhere. There should be no need for a bin to lose two to five tons of material before trying to determine what the rest of the bin is like. Also, if a car has been properly loaded, a sample should be as reliable when taken from the top of the car as when taken from a laboriously-dug trench. To determine the possibility of subsurface cheating or segregation some digging may be necessary; but most troubles of samplers come not from cheating, but from indifferent loading and handling in which segregation is evident.

Assuming that the product is shown by the cross-sectional chute samples to grade about at the middle between the limits of tolerance for every specified size, how can that mixture be kept *mixed?* As stated before, the sampler has learned that mixed sizes want to separate. Coarse aggregate sizes are not gregarious. They don't want to *congregate,* but to *segregate*—each size unto its own. Perhaps, if he had had some good engineering training, the sampler would have less trouble finding the preventives of these conditions—but then he would be an engineer and might have been considered too valuable in other lines of work to be allowed or assigned to sample *ad libitum* for the control of the product and the development of new ideas for the benefit of the plant and the product.

That's where the two phases of the segregation prevention must come together. Engineers must use the sampler's information to build the plant, to operate the equipment so as to produce the specification material, and to land it for transportation fixed ("frozen," if you please) in the desired mix. Yet other engineers must use his information to handle the mix so as not to undo what has so painstakingly been brought about. When the various engineering interests connected with the production and consumption of coarse aggregate have brought about trustworthy and effective control over the coarse aggregates problems, they are not likely to submit the results of their handiwork for acceptance or rejection, to samplers indifferently qualified to serve in that important capacity.

It is evident from what has been learned about surges on screens that trouble-preventives should start as far back as that stage. From what has been learned about segregations in bins, it seems logical that a flow of stone should not be allowed to maintain a constant trajectory. It seems to be a reasonable corollary that flows with fixed trajectories from two or more chutes are no more permissible than from one chute. One would expect quite as certainly that, in the loading of cars, measures would be taken to prevent a real segregation and vertical segregation of sizes. These are construction and operating problems, the solving of which results in the consumer receiving what he has ordered—a specified grading and uniform mixture. It is only after the producer's engineers have solved these problems that the consumer can be told, "Dig your trenches, not 'at points which appear to be representative of the material,' but *anywhere.*" Or, "Don't dig, unless you need exercise. The top is like the bottom!"

Impracticably ideal? No! It can be done and has been done. One simple method is to have the material enter the car through a pair of plates shackled fairly close together and swinging broadside back and forth crosswise of the car, and at the same time to have the car advance its length in about a minute, fall back, then repeat the performance till the car is loaded. That's not new. Only it is not often done, for the moving equipment costs money and may not be easily installed and operated if the plant was not designed for it. But the consumer's sampler, recognizing a car to have been loaded thus, knows that he need be concerned not with where to dig the trenches, or how deep, but only with the loss of coarse materials from his shovel when "lifting" the sample portions. Also, the consumer's engineer who is going to use the material knows, in such case, that when the material as made at the plant is supposed to run midway between the 30 to 50 percent specification "on" or "thru" a sieve size, one car won't sample 31 percent and the next, 49 percent. They may vary from 38 to 42 percent; and the reliability of his calculations for the grading of his concrete mix suffers less from variations between 38 and 42 percent for the two cars than if he uses either 31 or 49 percent, both of which figures would *pass* the cars and require their acceptance.

The situation is the same with rejections. Cars so loaded are less susceptible to the evils of poor trenching, and samples more nearly like plant samples are apt to be "lifted" than when the cars are loaded in any of the indifferent ways. Cars so loaded that 29 or 51 percent values in the foregoing cases could easily be obtained, would stand in danger of rejection—all because the mix wasn't so spread in either car that a sampler could with reasonable assurance get *portions* of the *mix.* If the segregated sections of a car run 29 or 51 percent when the product was made to run around 40 percent, but at least 30 percent, and at most 50 percent, through a certain sieve size, the blame does not lie with the sampler, but with the way the car was loaded.

Attention must in this connection again be called to the care necessary in digging trenches even in cars where the mix has been properly spread. Narrow trenches tend to accumulate finer sizes on the sides and in the bottom, while the coarser sizes are thrown out. The resultant sample usually runs "fine." It has here, too, been a matter of not infrequent experience to have an inspector properly widen a disappointing trench and get therefrom a sample the practical duplicate of the plant average from the car. That such results are not chance, but the direct sequence of controlled production and loading, has been demonstrated by sinking a rectangular frame a foot wide, a foot deep, and as long as the width of the car (like a long narrow box without top or bottom), into a car of coarse aggregate, and then taking out and sifting the enclosed mass. That procedure is not often necessary; but a consumer's engineer given or shown such a demonstration finds out

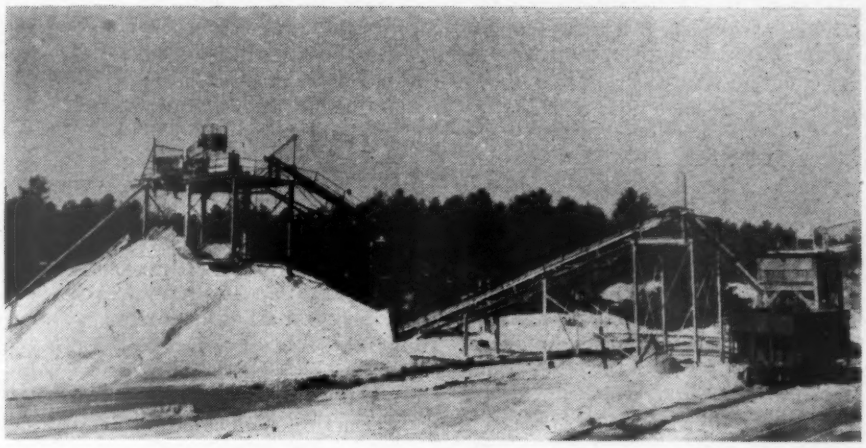
(*Continued on page* 94)

Unique Sand Plant Removes Minus 100 Mesh Fines from Granite Screenings

another ON THE SPOT report

THE Consolidated Quarries Corporation operates at Rock Chapel Mountain, near Lithonia, Ga., a large granite crushing plant the primary product of which is crushed stone aggregate. In the production of commercial sizes of aggregate considerable amounts of fines (passing ⅛ in.) are produced. Although some of this material has been marketed for asphalt road surfacing, the quantity produced in crushing was for many years considerably in excess of sales, and stocking the fines constituted a sizeable item of expense. By 1945 the company had accumulated a stockpile containing 500,000 tons of minus ⅛-in. fines, and a concerted effort was launched to develop markets which would at least absorb current production. This effort was further encouraged by the booming market for ready-mixed concrete in the Atlanta area.

By WILLIAM M. AVERY



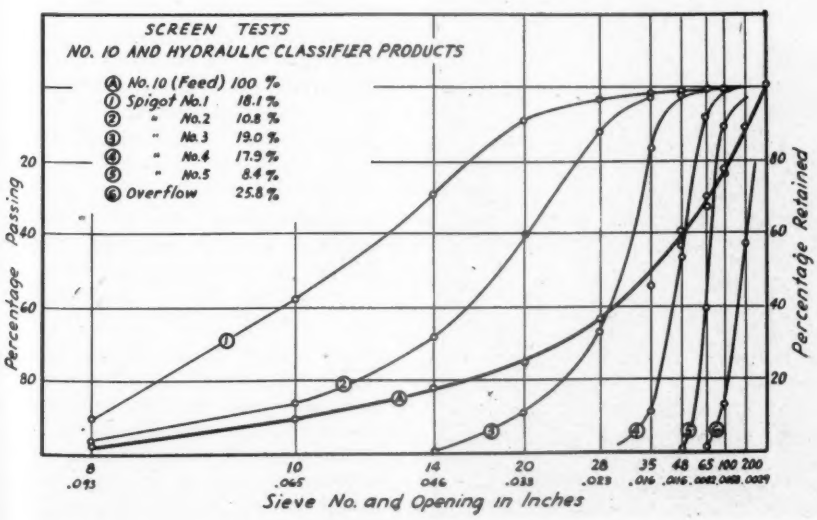
• A general view of Consolidated Quarries Corporation's sand plant at Lithonia, Ga. Hydraulic classifiers are supported on the steel tower at the left; the finished product discharges from the reclaiming tunnel into the car (right).

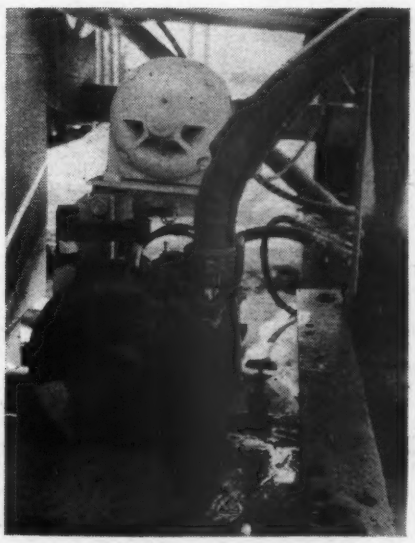
The problem involved the removal of a portion of the minus 100-mesh material. The material contained approximately 24 percent passing 100-mesh, against a limit of 8 percent in concrete fine aggregate specifications. Experiments were made with several types of classifiers, and in addition a 500-pound sample of the material was sent to the Deister Concentrator Co. for sizing. When the sized product was returned Consolidated was sufficiently encouraged to place an order for one of Deister's constriction-plate multi-spigot Concenco hydraulic classifiers.

The first machine installed was a 5-cell unit which was operated alone for a short time in order to determine the market response. The plant was actually developed as a pilot operation, designed primarily to find some of the answers to the problem, but acceptance of the product was so immediate and enthusiastic that it inevitably became a full-scale production unit. Even with the addition of two 10-cell classifiers shortly after the plant was placed in operation, output has been barely sufficient to take care of demand. The plant has now been in service for about a year.

Since this is thought to be the first successful application of hydraulic classifiers for making sand in the crushed stone industry, a detailed description of the operation seems in order. Fines and all wash water from the screens in the main plant are flumed into a 30-ton settling tank, where some of the surplus water is drained off. A 4-in. Wemco pump feeds the sand from the bottom of the tank through a 5-in. line to the three classifiers, which are located on a steel tower 35 ft. above grade.

Although almost any desired sand sizing can be achieved by proper combination of various spigot products (see chart), the market demand has so far necessitated no separation


SCREEN TESTS
NO. 10 AND HYDRAULIC CLASSIFIER PRODUCTS
A No. 10 (Feed) 100 %
1 Spigot No.1 18.1 %
2 " No.2 10.8 %
3 " No.3 19.0 %
4 " No.4 17.9 %
5 " No.5 8.4 %
6 Overflow 25.8 %
Percentage Passing
Percentage Retained
8 10 14 20 28 35 48 65 100 200
.093 .065 .046 .033 .023 .016 .0116 .0082 .0058 .0029
Sieve No. and Opening in Inches



• This 4-in. sand pump feeds material to the classifiers at the rate of about 60 tons per hour.

other than washing out minus 100-mesh. Eventually close-sized materials will be split off and blended to produce engine sand, masons' sand, plaster sand and similar products. Besides the control afforded by water valves on separate compartments of the classifiers, it is possible to select or discard the products from any of the spigots to meet a particular specification. As operated at present the classifiers produce about 2 tons of sand per hour per spigot in reducing the minus 100-mesh content from 24 percent down to 3 or 4 percent. Actually the maximum feed capacity of the three units is approximately 60 t.p.h., and fines are washed out at the rate of about 15 t.p.h. There are future market possibilities for the minus 100-mesh product, but at present it is flumed to a waste pit adjacent to the sand plant.

The spigot products are flumed to small, hand-tripped dewatering cones suspended beneath the classifiers, and the cones discharge onto a 250-ft. reclaiming tunnel which is straddled by the tower. The sole function of the cones is to remove enough water so the sand will not spread out beyond the feed limit of the tunnel. The 7-ft.-wide by 8-ft.-high reinforced-concrete tunnel is self-draining. It gives the sand plant a live storage capacity of close to 1,500 tons, with perhaps double that amount in addition available by using a bulldozer. The material is drawn through hand-operated gates in the tunnel roof onto a 24-in. belt conveyor which discharges directly into open-top cars on the adjacent railroad siding.

Considerable amounts of water flow into the reclaiming tunnel when the plant is in operation, and it has been found impractical to run the loading belt, which has a 16-degree incline at the discharge end, when the sand is excessively wet. To get around this minor obstacle, it has become the practice to operate the plant for 8 hours, and to load cars for 2 hours each day, a division which seems to strike a good balance between production and shipments. Actual output runs close to 300 tons per day, and between 5 and 6 cars are loaded in an average day. A 2-man crew is adequate for both production and loading operations.

As now set up and operated, the sand plant is in almost perfect balance with Consolidated's main crushing plant, and its product is going entirely to ready-mixed-concrete producers in the Atlanta area. Due to its angularity the sand has a tendency to be somewhat harsh, and to overcome this most users blend with it a small quantity of natural sand which acts as a lubricant.

With current production of fines adequately taken care of, the company set up a second small plant to whittle away at the 500,000-ton stockpile. This secondary unit takes care of all truck-loading business, supplying about 30 concrete block plants in Atlanta and vicinity. It produces about 150 tons per day of sand averaging around 8 percent through 100-mesh.

The secondary plant is built around a Bucyrus-Erie 20B clamshell crane which loads material from the stockpile into a feed tank. Working one hour each day, an International TD-14 bulldozer is able to shove an adequate amount of sand within reach of the crane. The sand is sluiced with water from the feed tank into launder-type classifiers which were built in the company's shop. There are three of these units in a row, and they increase in area from the first to the third. Each contains a baffle plate and utilizes a rising current to effect the separation of extreme fines. The sand flows from the launders into a small dewatering basin, and from there is reclaimed, stacked, and loaded into trucks by the clamshell.

With two healthy markets developed for what was once regarded (however reluctantly) as a waste material, it might be supposed that Consolidated would rest on its laurels for a while. On the contrary, at last report this progressive concern was busily exploring still other possible uses for granite fines. One field of exploration is the separation of the constituent minerals to obtain feldspar, or an iron-free quartz-feldspar mixture, which could be used by the ceramices industry. Flotation and magnetic removal of biotite and magnetite have already achieved satisfactory separations in the laboratory. In this regard, the classifier overflow from Consolidated's sand plant operations offers especially attractive possibilities, since the material is already fine enough so that mineral unlocking can be accomplished without additional grinding.

Another promising outlet for granite fines is their use as a major constituent in rock wool production. Experiments indicate that granite and limestone combined for this purpose produce a mineral wool which compares very favorably with some glasses. Under the impact of this multi-directional attack, it will be surprising indeed if Consolidated's 500,000-ton stockpile doesn't recede steadily. If the process should prove to be too slow, we have complete confidence that the company's alert management will develop new avenues of attack.

• A closeup of one of the 10-spigot hydraulic classifiers. Proper blending of various spigot processes will enable the plant to produce material of almost any desired specifications.

The Coast Guard recently inspected the steamer *C. C. Slider* at Louisville, Ky., incidental to alterations and improvements planned for the boat. She is the property of E. T. Slider, Inc., a well-known concern in the sand and gravel towing business in local waters.

the lime plant operator

by WOLF G. BAUER
Consulting Engineer

ECONOMICS OF PLANT OPERATION
PART II. CONSTRUCTION OF THE INVESTMENT INDEX

IN PART I of this series, stress was laid on the importance and necessity of close cooperation between the engineer and the cost accountant in analyzing and setting up a plant investment guide by which management can be placed in yearly or periodic position to spend the improvement or expansion dollar in sequence of diminishing returns. To be without such a periodic analysis and plan, is to spend money unwisely, for often the most obvious correction or improvement is not at all the one which will achieve maximum earnings per unit time, or per unit product. We have also shown by examples of economic balances, why and how this can come about. The present discussion will indicate a simple generalized approach and steps of procedure toward setting up such an analysis, and the form of a working index.

There are cost accounting systems, and there are systems of every sort and state of complexity. However, often they serve only as a statistical resume of operating costs. Some systems are so extensive and detailed, that it almost takes separate cost accounting to keep track of them. We do not wish to add to the confusion here. Neither is it the purpose to go into the details or technique of cost finding. Rather do we wish to illustrate the basis upon which cost figures must be obtained for this purpose, and how such figures may be applied to the intelligent and scientific spending of the improvement dollar. No matter how small the operation, how limited or extensive the present or potential market, how old or new the operation or plant, or what current type cost-finding system in use, the master analysis and cost-percentage flow sheets are fundamental in all cases, even though the details will differ in every instance.

Steps of Procedure As in the chemical analysis of lime or limestone, where the accuracy and dependability of the results are only as accurate and dependable as the sampling of the material, so also should the collected cost figures represent true relative values. However, it is more important to obtain true relative values than to spend much time and money on the obtainment of detailed cost figures. The following general steps may be considered:

1. List and classify your major operating departments. (In large plants, this may mean all those which have a separate superintendent or foreman, while in smaller plants, the grouping is made according to the stage or phase of processing.)

2. The second step consists of arranging all costs under each department so that each cost item represents a single or grouped point of attack, i.e., labor saving, power

I	II	III	IV	V	VI	VII	
IMPROVEMENT DESIGNATION	PERCENT OF DEPT. COST	PERCENT OF OVERALL COST	INVESTMENT REQUIRED	NATURE OF INVESTMENT	PERCENT SAVINGS TO BE REALIZED ON EACH ITEM	PERCENT NET SAVINGS IN TERMS OF OVERALL LIME COST *	
A Kiln fuel	60	20.0	$20,000	Equipment to change over to new lower-cost of fuel	15	3.00	
A1 New kiln equip.	—		16,000	Direct contact preheater	20	4.00	
A2 New kiln equip.	—		4,000	Instruments & controllers	5	1.00	
A3 New kiln equip.	—		6,000	Direct contact blast cooler	10	2.00	BURNING DEPARTMENT
B Firing labor	15	5.0	15,000	Automatic stone conveyor	35	1.65	
C Total fuel preparation	10	3.3	9,000	Bins & feeder	30	1.00	
D Total power	8	2.6	3,000	Drives & power factor correction	10	0.26	
E Repair Maintenance	7	2.3	5,000	Better refractories and burners	20	0.46	
	100%	33.2%					
F Sacking & loading labor	50	7.0	14,000	Bins & conveyors	33	2.30	
G Milling power	20	2.8	8,000	Rearrangement of equip. Extra bin space Machinery improvements	10	1.80	MILLING & LOADING DEPT.
H Milling labor	18	2.5			50		
J Maint. & repair	12	1.7			20		
	100%	14%	$100,000 TOTAL			17.47% TOTAL	

*NOTE: Interest + depreciation allowed for

Table I

I		II		III			
IMPROVEMENT DESIGNATION ORDER OF SIZE INVESTMENT		ORDER OF MAX. RETURNS PER ITEM		ORDER OF MAX. RETURNS PER INVESTMENT			
				ITEM	% PER $1000	ACCUM. INVESTM	ACCUM. SAVINGS
A	$20,000	A1	4.00%	A3	.330	$ 6,000	2.00%
A1	16,000	A	3.00%	A1	.250	22,000	6.00
B	15,000	F	2.30%	A2	.250	26,000	7 00
F	14,000	A3	2.00%	GHJ	.225	34,000	8.80
C	9,000	GHJ	1.80%	F	164	48,000	11.10
GHJ	8,000	B	1.65%	A	.150	68,000	14.10
A3	6,000	A2	1.00%	C	.110	77,000	15.10
E	5,000	C	1.00%	B	.110	92,000	16.75
A2	4,000	E	0.46%	E	.090	97,000	17.21
D	3,000	D	0.26%	D	.080	100,000	17.47

Table 2

saving, control, maintenance, equipment, process, etc.

3. The next step is to transpose current costs to a percentage of department basis, and a percentage of overall or average finished product basis. (This constitutes the first three columns of Table 1, which is an example of the listing of two typical departments.) This is as far, generally, as the accountant can go.

4. Economic balances must now be set up and solved as was shown in Part I. Regardless of whether there should be a choice of proceeding on either an increased plant efficiency basis (limited market, minimum cost per ton) or an increased production basis (maximum earnings per unit time), the steps involve the solution of successive cost equations for various production levels, or new department efficiencies. This requires an engineering analysis of operations, process, or equipment in relation to maximum potential output or efficiency which can be realized through additions, re-arrangements, re-design, process, equipment, or schedules. So the fourth step is the most difficult, requiring an engineering estimate of every cost group (process phase) of the plant when operating under more favorable than current conditions, or increased capacity. Results of this analysis are then listed as in columns IV, V, and VI of Table 1. The percentage cost saving figures constitute net amounts after depreciation and interest of and for any equipment invested for achieving such savings. A last column (VII Table 1) is computed, showing the final net savings per unit product. This requires that an average product cost be computed, under which various types of quicklime, hydrate, and stone products are included. This is justified since all figures are based on the total plant income or production cost.

5. Another chart can now be prepared in which investments, and earning or profit percentage increases are arranged in various sequence and order for analysis. (Table 2.)

6. From the data thus collected, an index curve or graph may be plotted which should prove very interesting and helpful to management in arriving at its decisions for the appropriate spending of plant investment money for maximum immediate returns, and in a scientific and logical order. (1.)

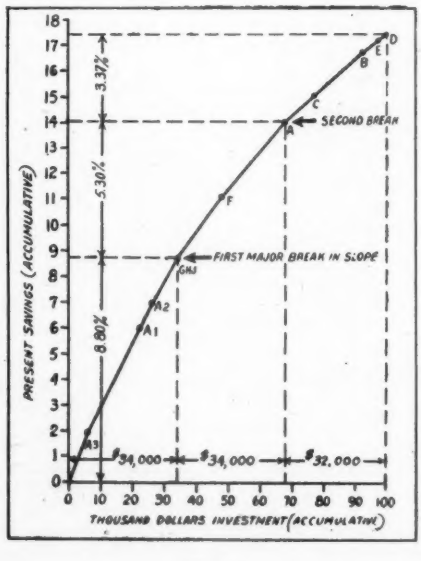


Fig. 1

The hypothetical examples of figures are given only for purposes of clarifying the procedure and results obtained. The tables illustrated only two departments. In actual practice, of course, many more points and groups will be shown. Results of such an index preparation will, in many instances, be quite an eye-opener to management and supervising personnel, and may change the attitude or direction of development effort on the part of many individuals in a concern. Why not make it work for you?

In the next installment we shall go through the operation with a fine-toothed comb, picking out all the possible weak spots that constitute a drain and anchor, and suggesting a systematic approach toward their correction.

New Victorville Plant

(*From page* 80)

uct quality.

Final storage bins feed two St. Regis 1-tube packers, all products being packed in multiwall paper valve bags. A Toledo scale is used for checking weights occasionally. The company's quality brand is Albacar — "alba" (white); "car" (carbonate).

Eastern headquarters of C. K. Williams & Co. are at Easton, Pa., while main offices for the West are located in Emeryville, Calif., across the Bay from San Francisco. E. A. Piercy is manager of the Victorville plant.

Coarse Aggregates

(*From page* 90)

thereby that the plant not only makes "specification" aggregate, but ships it properly mixed.

Our hypothetical sampler of concrete aggregate, first in helping produce, and then in passing on the efficacy of the production and shipping controls, has learned many more lessons than those enumerated. One of the most valuable is that his own methods and procedures must be continually subjected to careful scrutiny and test. What sounds "reasonable" may with discriminating tests prove very fallacious. He learns that vigilance has other associations than with the "price of liberty." Eternal and critical vigilance is an invaluable and indispensable requirement for serving properly the respective interests of the producer, and of the consumer of the concrete coarse aggregate.

personal mention

The Lehigh Portland Cement Company has announced numerous changes in personnel:

W. J. McCoy

RAYMOND R. BEAR, vice-president and general manager, retired December 31st, concluding an unusual record of 50 years with the same company. He was employed as a draftsman in 1897, even before the Lehigh Portland Cement Co. was incorporated. His ability was recognized in his advancement to chief engineer; to vice-president in 1926; and to vice-president and general manager in 1937, when he succeeded the late Daniel E. Ritter. Mr. Bear will continue as a director of the company.

JOSEPH C. PEARSON retired as director of research on December 31, 1947. He went to Lehigh in 1924 from the U. S. Bureau of Standards, where he had been engaged in cement and concrete research. He has gained national recognition as an authority in his field and is a past president of the American Concrete Institute, as well as a long-time member of committees C-1 and C-9 of the American Society for Testing materials.

WALTER J. MCCOY has succeeded Mr. Pearson as director of research, being promoted from the position of manager, research laboratory. He entered the laboratory in 1938 as research chemist.

JAMES A. GISH JR., plant manager of the Sandt's Eddy plant, also retired December 31. Mr. Gish was the first superintendent of this plant, having gone there at the time of its construction, from the Bath plant.

GEORGE W. HANNAMAN became plant manager, succeeding Mr. Gish. Mr. Hannaman was employed by Lehigh as a draftsman at the Mason City plant in 1937. He served four and a half years with the Army Engineers in World War II. Prior to going to Sandts Eddy, he was assistant plant manager at Mason City, Ia.

In the engineering department, T. W. SHIELDS retired as chief draftsman on December 31, after a service which dates back to 1903. POUL G. BUSCK has been appointed chief mechanical engineer. He entered the cement industry at the former Tidewater plant at Union Bridge, Md., in 1922. Transferred to Allentown in 1927, he became assistant chief draftsman in 1931. ROBERT V. WRAY has been named chief maintenance engineer. Mr. Wray was graduated from the University of Durham, England, and had a broad industrial experience before joining Lehigh in 1937. JOHN R. LEINBACH has been promoted to chief electrical engineer from electrical engineer. He was employed by Lehigh in 1926 after a varied experience in electrical engineering. FOSTER E. BENNER advanced to assistant chief mechanical engineer at the same time from the position of mechanical engineer.

At the Buffalo, N. Y., plant, ROBERT E. JONES was promoted from plant manager to assistant plant manager and supervising chemist. RICHARD W. WHEATON, formerly electrical engineer, was advanced to maintenance engineer.

GERALD W. BUSS was appointed chief clerk of the Iola, Kan., plant, where he has been assistant chief clerk. Mr. Buss succeeds C. E. RUSSELL, who was employed at this plant in 1917 and became chief clerk in 1918.

J. G. Miller

JAMES GILBERT MILLER, associated with Westvaco Chlorine Products Corp. since 1930, has been appointed resident manager of Westvaco's new elemental phosphorous plant, which is being constructed at Pocatello, Ida.

Mr. Miller had extensive engineering experience in nonmetallic mineral production prior to joining Westvaco 18 years ago. He has served the firm as project engineer at South Charleston, plant manager at Carteret, N. J., and assistant manager at South Charleston.

RICHARD E. DOUGHERTY, vice-president, New York Central System, has been elected president of the American Society of Civil Engineers for 1948.

New vice-presidents elected were: COL. CARLTON S. PROCTOR, New York, and JOHN W. CUNNINGHAM, Portland, Ore. Both are consulting engineers.

The appointment of LEROY C. HAMILTON as traffic manager of the Huron Portland Cement Company has been announced by P. H. Townsend, vice-president and general manager. Prior to coming to Huron in 1946, Mr. Hamilton was in service in the Pacific with the Navy. Previously he was associated with the Wabash and Canadian Pacific Railways in Detroit.

J. B. Perry

JOSEPH B. PERRY, associated with Westvaco Chlorine Products Corporation since 1920 and formerly mines manager in charge of Westvaco's magnesite, barite, dolomite and other nonmetallic mineral production, has been appointed mines development manager, effective January 1, 1948.

In his new work, Mr. Perry will be in charge of mineral exploration activities, mine property development and beneficiation methods for all Westvaco mining operations. He will continue to maintain headquarters at Westvaco's Newark, Calif., plant.

W. R. Smallwood joined the sales force of the General Crushed Stone Co. in the Syracuse district on February 1, 1948.

After serving four years in the Army Air Corps in this country and overseas, Mr. Smallwood was employed by the Barrett Division of Allied Chemical and Dye Corporation as a sales representative at their Norwood, N. Y., plant.

MELVIN H. BAKER, president of the National Gypsum Company, Buffalo, N. Y., has been appointed chairman of a construction industry information committee to inform the public on performance and progress of building in the United States. The committee's offices will be in Washington, D. C. About 130 individual companies are represented in the personnel of the group.

C. E. RUSSELL, chief clerk, R. E. MCDONALD, general mill foreman, J. A. FISHER and R. D. MORITZ, also foremen, recently retired at the Iola plant of the Lehigh Portland Cement Company. All had passed Lehigh's retirement age. As a group they spent 120 years in the employ of the company.

R. GIBSON is the new plant superintendent at the Valley Quarries Company's plant near Kincaid, Ill.

SCOTT P. HART has been named Montana state highway engineer by Governor Sam C. Ford. He succeeds H. W. Holmes. Mr. Hart has been with the Montana Highway Department for a quarter century, during which he advanced from instrument man to resident engineer, division engineer, maintenance engineer and materials engineer.

Mr. Holmes, stepping down at his own request, will continue as bridge engineer.

The appointment of ROBERT B. LENHART as sales manager of the Gravel Products Corporation, Buffalo, N. Y., effective Feb. 1, has been announced by President Ernest M. Hammond. Mr. Lenhart, who has been with the Lehigh Portland Cement Company for about 25 years, succeeds NORMAN HUBER. For the last year, Mr. Lenhart has been district sales manager of Lehigh Portland Cement in Pittsburgh and prior to that held a similar position in Buffalo for about 18 years.

WILLIAM J. TINSMAN, plant engineer, and EDWARD RENNER, master mechanic of the Giant Portland Cement Co. of Philadelphia, were awarded a prize of $100 in a national contest on arc welding design and application recently conducted by the James F. Lincoln Arc Welding Foundation of Cleveland, O.

The two men collaborated on a technical description with photographs and drawings of a grandstand erected at Egypt Memorial Park as a memorial to war veterans.

EARL REEB was recently appointed highway director for the state of Ohio by Governor Thomas J. Herbert. He succeeds Murray D. Shaffer, resigned. Mr. Reeb has been engaged in engineering work for the last 36 years, and until his promotion served as chief of the bureau of maintenance in the Ohio State Highway Department.

CARL H. BAUER has been appointed assistant to the president, it was announced by Bror Dahlberg, president of The Celotex Corporation. Previously, Mr. Bauer had been executive vice-president and general manager of the Warren City Tank and Boiler Company and, prior to that, executive vice-president and treasurer of the Higgins Corporation of New Orleans.

FRANK A. SWEENEY was recently elected vice-president in charge of sales for the National Portland Cement Company of Philadelphia, Pa.

N. Y. Cement and Gypsum Firms Awarded Safety Plaques

Several firms in the Buffalo area engaged in the gypsum and cement industries were awarded plaques for excellence in safety at a dinner in the Hotel Statler, Buffalo, sponsored by the Buffalo Chamber of Commerce.

The awards were made in conjunction with the 1947 accident prevention campaign sponsored by the Associated Industries of New York State. Honored were the Lehigh-Portland Cement Co., Certain-teed Products Corp., Louisville Cement Co., National Gypsum Co. and Universal Atlas Cement Co.

obituaries

HOWARD ECKFELDT, a retired professor of mining engineering at Lehigh University, Bethlehem, Pa., died in Lima, Peru, on March 1. He went to Peru to make his home with his children after his retirement in 1946.

JOHN G. THOMAS, aged 50 years, formerly associated with the Makins Sand & Gravel Company at Oklahoma City and later co-owner of the P. & P. Gravel Company, died on January 29 in Tulare, Calif., where he had made his home in recent years.

EDWIN P. LUCAS, who was formerly president of Superior Portland Cement, Inc., and of the Bellingham Coal Mines, Inc., Seattle, Wash., died on January 19 in that city.

FRANK M. KELLY, general manager of the Greer Limestone Company, Greer, W. Va., died at the Mayo Clinic at Rochester, Minn., on February 26 after having undergone surgery. He had been manager of the limestone plant for the last 12 years.

ABRAHAM LINCOLN WOLF, 75, a director of the Alliance Sand Co., Northampton, Pa., and a retired master mechanic at the Northampton plant of the Lawrence Portland Cement Co., died on February 24 at his home in Thomaston, Me.

JOSEPH C. PEARSON, 68, retired research director of the Lehigh Portland Cement Co., died on March 16 in Allentown, Pa. A past president of the American Concrete Institute, he retired on January 1 after 24 years with Lehigh.

DR. H. FOSTER BAIN, adviser on mining to President Manuel A. Roxas and the late President Quezon of the Philippine Islands, died on March 9 in Manila. Death occurred at Santo Tomas Hospital, where Dr. Bain suffered a cerebral hemorrhage. He was 76 years old.

HERBERT P. WHITLOCK, curator emeritus of mineralogy at the American Museum of Natural History in New York City, died in his home on February 22 after a protracted illness. He was 70 years of age. Mr. Whitlock joined the staff of the museum in 1901 and was appointed state mineralogist in 1916. Two years later he became curator of the mineralogy department at the museum. He retired from his duties in 1941.

PAUL L. BIASELL, who was purchasing agent for the Huron-Portland Cement Company since 1912, died on February 15 at a Detroit hospital after an extended illness.

REPRESENTATIVE JOHN M. ROBSION, a Republican legislator from Kentucky's 9th district and chairman of the House Committee on Mines and Mining, died unexpectedly of a heart attack while visiting in Barbourville. He was 75 years of age.

THOMAS MOSES, director of the Illinois State Department of Mines and Minerals and one of the most colorful figures in the mining industry, died at Danville, Ill., on February 20 at the age of 78 years. He became a state mining inspector in 1907 and was later associated with various mining concerns. In 1947 Governor Green of Illinois appointed him to the post which he held at the time of his death.

DR. ROLLIN T. CHAMBERLIN, 66, professor emeritus of geology at the University of Chicago, died of coronary thrombosis in that city on March 7. He was recognized as one of the world's greatest geologists. Dr. Chamberlin devised the rock dusting system for coal mines, to reduce the danger of blasts.

DUNCAN C. WALKER, who was vice-president of the Senior Sand and Gravel Company, Bethel, Conn., died at his home in February at the age of 53 years.

RAYMOND SMITH, an employee of the Linwood Stone Products Company, Davenport, Ia., was fatally injured in an accident at the firm's quarry on February 23. The 24-year-old victim had worked at the quarry only three days before the mishap.

HUGH I. HICKS, for nearly 25 years an employee of Ohio Valley Sand & Gravel Co., was killed on the dredge *Panama* on January 20 when his clothing became entangled in a cog. For many years he was an engineer and chief engineer on the best known Ohio River steamboats. He was 68 years of age.

CAPTAIN BERTRAM M. THOMAS, a member of the Warner Company's Marine Department, who served that firm for 44 years, died on December 28, 1947, after an extended illness. He was 73 years of age.

Captain Thomas was a past president of the company's Quarter Century Club.

New Film Now Available on Safe Jackhammer Operation

The prevention of injuries to jackhammer operators in quarries has been a major safety problem in that industry for years. The new slidefilm entitled *Jackhammer Safety* is intended to strike hard at this source of accidents.

The film consists of 49 frames emphasizing safe dress, inspection of equipment, and safe and unsafe practices in each step of the jackhammer operator's work. A guide is furnished with each strip to assist the leader of a meeting to make effective use of the film. The guide contains suggestions for the meeting and appropriate comments pertaining to each frame in the film. Occasional questions

• Inspecting rock before drilling.

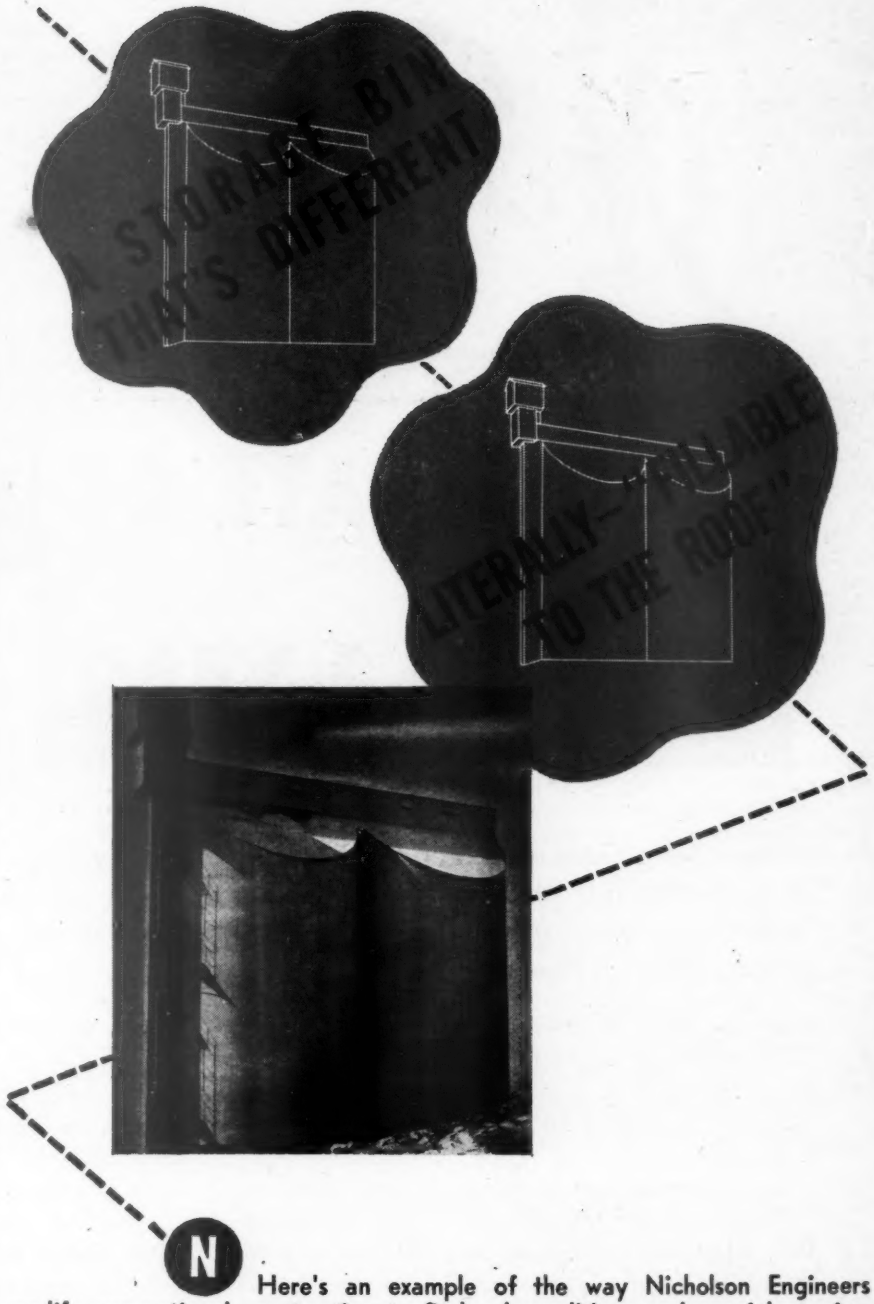
provide an opportunity to bring the men into the discussion and thus make the meeting interesting and more instructive. These desirable training aspects are augmented by legends and captions on the frames.

The price of the film is $10.00, including the guide, to members and $20.00 to non-members. Copies may be obtained by writing the Cement & Quarry Section, National Safety Council, 20 N. Wacker Drive, Chicago 6, Illinois.

Diamond Division Permanente Sets New Record in Output

During 1947 the Diamond Division Cement Plant of Permanente Cement Co., produced limerock, clinker and finished cement in excess of any other year since it began making cement in 1928, the figures reaching nearly 850,000 barrels. The quarry at View Cove, Dall Island, Alaska, quarried and delivered nearly 220,000 tons of crushed lime rock to the S.S. *Diamond Cement* for transportation to the Seattle plant. This vessel is owned by the Permanente Steamship Corporation, a subsidiary of Permanente Cement Co.

In commenting on the outlook for 1948, Gordon Tongue, division manager of the Diamond Division, said: "We have plans under way for new machinery and equipment which will add another 100,000 barrels to our manufacturing capacity, and hope it will be installed by the end of this year. Meanwhile, present indications are that the plant will produce more cement in 1948, adding still another 100,000 barrels of cement to the local supply."



N Here's an example of the way Nicholson Engineers modify conventional construction to fit local conditions and special requirements.

The roof is sharply sloping (1) to provide good watershed and to reduce the snow load in winter and (2) to reduce to a minimum waste storage space; the slope is about the angle of repose of the material being stored.

Let Nicholson Engineers work on your storage requirements whether they involve solids or liquids. We can bring to your problem a specialized experience in "Storage Engineering" dating back to 1914 and trained construction men who can translate plans into a finished storage system promptly and economically.

Construction costs are not coming down!
BUILD NOW

BULK STORAGE COAL-GRAIN-LIQUIDS STORAGE HANDLING EQUIPMENT
THE NICHOLSON CO.
CONSTRUCTION CEMENT-OIL-CHEMICALS
TEN ROCKEFELLER PLAZA, NEW YORK, N. Y.

It Saves

"The 45-ton General Electric diesel-electric locomotive which we recently placed in operation has surpassed our expectations, and our only regret is that we did not replace our large steam locomotive at an earlier date." G. R. Kilbourn, Plant Engineer, Marion Power Shovel Co., Marion, Ohio.

Last September a G-E 45-ton switcher replaced an old 50-ton steam locomotive at the Marion Power Shovel plant. A few months later Mr. Kilbourn compared costs and found plenty of reasons for enthusiasm.

At the present rate of saving the new switcher will pay for itself in *less than three years*. Savings in fuel, labor and maintenance cut the hourly cost from $7.13 for the steamer, to $3.17 for the diesel-electric. While the steamer operated 16 hours a day, 5½ days a week at an annual cost of $32,626, the G-E diesel-electric operates nearly 50 per cent more hours at an estimated annual cost of only $21,532. At this rate savings will average over $11,000 a year *even though the new G-E switcher is working 50 per cent longer, with additional fuel and labor expense.*

The diesel-electric works 5½ days a week, 24 hours a day, except for 15 minutes required for daily refueling. There are no ashes to haul, no fire boxes to maintain. Seven days a week it is ready for *immediate** operation 96% of the time.

HOW MUCH WILL *YOU* SAVE?

You'll want to compare this performance with that of your own locomotive—find out for yourself the savings you can make in your plant. Simply call your nearest G-E representative today. He'll survey your own switching needs and estimate your savings in advance. No obligation. *Apparatus Department, General Electric Co., Schenectady 5, N.Y.*

***PUSH-BUTTON STARTING**

G-E diesel-electrics start at the push of a button. No time lost getting them ready for work. Simply open the throttle and the locomotive accelerates quickly and smoothly.

Switch to GE Diesel-electrics

And Save!

GENERAL ELECTRIC

120-36

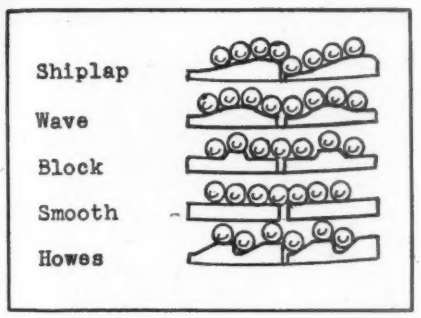
new machinery and supplies

PIT AND QUARRY

● New Mill Liner

A highly-efficient type of liner for ball and rod mills is now being offered the cement and other processing industries in the pit-and-quarry field which use this type of grinding equipment.

Known as Howes patented liners, they are designed to interlock the grinding



media with the liners so efficiently that they are reported to have increased grinding capacity up to 15 percent and reduced liner wear as much as 30 percent in numerous plants where they have replaced other types of liners. The accompanying sketch illustrates the position of the balls or rods in profile with conventional liners of the shiplap, wave, block, and smooth types as compared with the Howes liner.

These advanced liners are conveniently adaptable to all makes of ball, rod and tube mills, having been successfully used in Marcy, Allis-Chalmers, Traylor, Denver and Hardinge mills up to 10½ ft. in diameter. Among the licensees and foundries supplying them in the United States are the Allis-Chalmers Mfg. Co., Milwaukee; Mine & Smelter Supply Co., Denver; Rogers Iron Wks., Joplin, Mo.; and Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

Interesting technical and performance data may be obtained from the licensor, Warren L. Howes, 4654 W. Point Loma Blvd., San Diego, Calif.

● Welding Generator

Deliveries of a 300-ampere bare welding generator are now being made by P&H. This unit, claimed to have a welding service range of from 30 to 375 amperes, is offered to those who wish to build their own d.-c. welder. Called the Model WG-300, it is designed for easy coupling to a gasoline engine or power take-off. A V-belt pulley arrangement makes exact alignment between power and generator unnecessary, thereby simplifying the building of the welder. In addition to saving space, more correct relationship between engine and generator speeds is provided.

This model has just one control for any desired welding heat within the machine's entire range. P&H's "Visa-matic" calibration plate enables selection of the correct welding current for all classes of electrodes.

● A Mobile Lube Depot

The Industrial Division of Gray Company, Inc., of Minneapolis, manufacturers of lubricating and maintenance equipment, is now marketing the "Graco Trail-Luber," a mobile lubrication depot for big machinery.

Complete, compact and self-powered, the new Trail-Luber services contracting, logging, mining, and other heavy equipment on location.

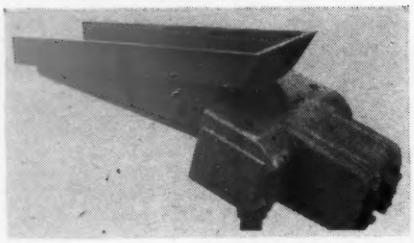
Included on the unit are a two-compartment hopper for pressure lube and gear lube; two air-operated pumps; two 20-ft. lubricant hoses with suitable adapters; one 25-ft. air hose with airline coupler, tire chuck and blower valve; a Briggs & Stratton "A" heavy-duty engine, rated 1¾ hp.; and an air compressor with a 15-gal. storage tank, which delivers 7 c.f.m.

Two Trail-Luber models are available. One is skid-mounted, for easy mobility on pick-up truck, or for stationary mounting on dock or similar platform. The other, easily pulled behind a car, truck or tractor, is mounted on automotive-type wheels with pneumatic tires, and has a tongue, tongue stand and trailer hitch.

● Vibrating Feeder

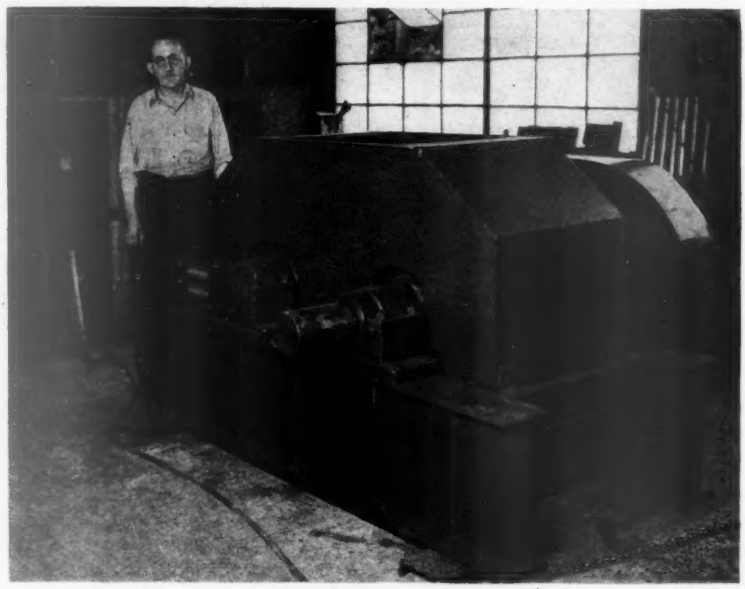
The Jeffrey Manufacturing Company, is now producing an electric vibrating feeder with a newly designed enclosed power unit. This unit is primarily for use in installations where the material to be handled is magnetic, hot, dusty and abrasive.

Such installations often are afflicted



by hot magnetic dust which sifts down on the open magnetic motor of the vibrating feeder or conveyor and causes serious damage to the coils and pole-faces.

This enclosed vibratory power unit is entirely dust-tight. It is also provided with air inlet and outlet features, so that a stream of air may be circulated through the motor and, if necessary, build up a slight interval pressure which acts as double insurance toward keeping the dust out. The Jeffrey Mfg. Co., Columbus 16, Ohio.



The Bonded Scale Company, Columbus 7, Ohio, has new double roll crushers for cinders, coal, and similar crushing jobs. They will handle up to 100 tons of cinders per hour. The rolls are mounted on a welded I-beam frame, thoroughly cross-braced. The space between the rolls is easily adjustable for changing the size of the resultant. Toothed, smooth, and several types of corrugated rolls are available. Roll material is of maximum hardness possible while still machineable. Arrangement can be made for free crushing tests in the company's factory.

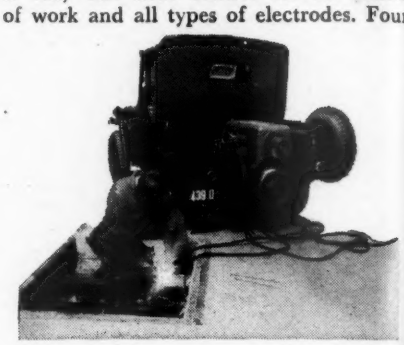
● Adjustable Idler

A new adjustable troughing idler that materially increases the life of conveyor belts has been announced by Koppers Company, Inc. The inventor is P. J. Conners of Koppers' Engineering and Construction Division, who has assigned the patent to his company. Outer inclined pulleys are adjustable from slightly above horizontal up to an angle of 25 degrees. All idler pulleys are located in the same vertical plane and the adjustment of the outer pulleys is accomplished in a manner which maintains a constant gap between the ends of the horizontal and inclined pulleys. This gap is kept to the minimum to eliminate any possibility of the belt being damaged due to creasing or pinching at such points.

This idler is suited for use at locations on conveyors where any inclined belt changes to a horizontal path. A suitable number of these idlers can be used to form a vertical curve and provide the shallowest depth of trough necessary to retain the material without spill. The shallow trough also reportedly eliminates excessive belt stretch at the edges. When similarly used at the feed and discharge ends of belt conveyors, the idlers allow the belt to be troughed or flattened gradually, thus reducing the strain on the belt due to the elimination of abrupt distortion as it enters or leaves the idlers. Koppers Co., Inc., Pittsburgh 19, Pa.

● Jeep-Mounted Welder

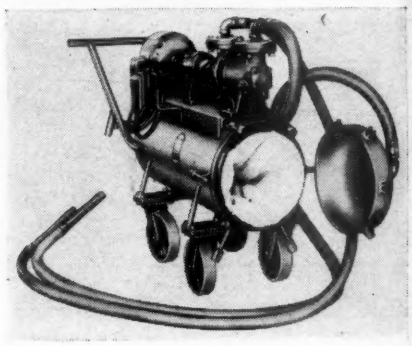
Working with the Schwartz Motor Company of Milwaukee, Willys jeep dealer in that city, the Harnischfeger Corporation has developed a new method of jeep-mounting an arc welding generator. A standard P & H Model WG-200 welding generator was coupled to the rear power take-off of the jeep. Pulleys of the proper ratio permit the engine to operate at approximately 1,500 r.p.m., a speed which enables the welding generator to operate at peak efficiency over its welding range, 30 to 260 amperes. There is only one heat control for all classes of work and all types of electrodes. Four



bolts hold the generator in place at the rear of the jeep.

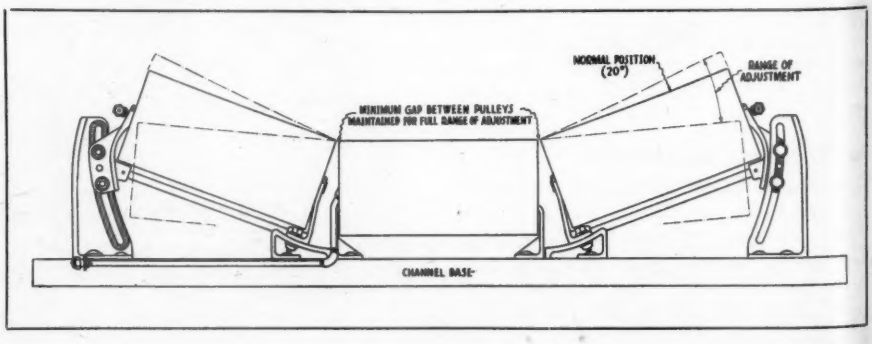
● Coolant Filter

Just added to its line of oil and coolant clarification equipment by Honan-Crane Corporation is a new mobile machine tool coolant filter which offers completely effective filtration plus unusual simplicity of operation and ease of emptying. The new unit is mounted on four 8-in. caster wheels for maximum mobility. It is powered by its own motor and vacuum pump and operates on a continuous cir-



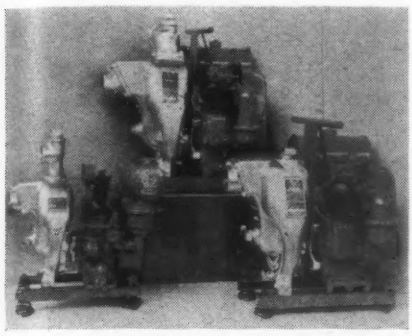
culation arrangement from a suction hose through the filter tank and discharge hose. The flow rate is 12 g.p.m. The coolant is processed in the machine sump and the individual machine can be cleaned up without slop or mess or time-consuming manual raking. Abrasives do not enter the pump.

The filtering medium is a close-woven cloth bag within a perforated metal basket. Dirt and chips are held in the bag, which is easily removed from the basket for emptying. The entire unit will tilt at a 45-degree angle on the rear wheels and auxiliary legs to facilitate emptying. The filter bag can be washed in a degreaser and reused. The only controls are starting and stopping switches.


NORMAL POSITION (20°)
RANGE OF ADJUSTMENT
MINIMUM GAP BETWEEN PULLEYS MAINTAINED FOR FULL RANGE OF ADJUSTMENT
CHANNEL BASE

● Centrifugal Pump

Faster automatic priming is one of four major improvements in the Gorman-Rupp line of lightweight, centrifugal, self-priming pumps, resulting from the development of a new priming prin-



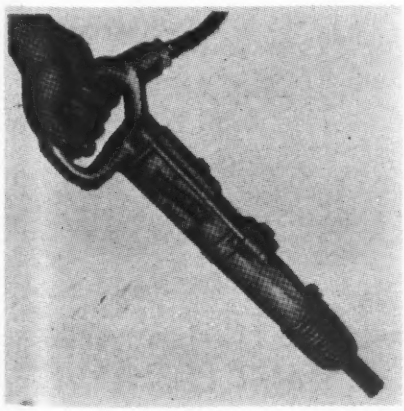
ciple. These new pumps are classified as general utility pumps for use where lightweight, mobile, powerful pumps are needed.

Three sizes in which the pumps are available are: (1) the 1½ in. pump, powered by either a Lawson or Briggs & Stratton 1½ hp. engine, maximum capacity 86 gals. per min. at 30 foot heat, maximum lift 30 feet, priming time 1 minute 15 seconds at 25-ft. suction lift, weight 62 pounds; (2) the 2-in. pump, powered by a Wisconsin 2.8 hp. single-cylinder, 4-cycle air-cooled engine, maximum capacity 156 gals. per min. at 30 foot head, maximum lift 30 feet, priming time 47 seconds at 25-ft. suction lift, weight 110 pounds; (3) the 3-in. pump, powered by a Wilson 5 hp. single-cylinder, 4-cycle air-cooled engine, maximum capacity 280 gals. per min. at 30-ft. head, maximum lift 30 feet, priming time one minute 19 seconds at 25-ft. suction lift, weight 117 pounds.

Maximum lifts and priming times for all sizes are given as performance at sea level. Gorman-Rupp Co., Mansfield, O.

● New Lightweight Drill

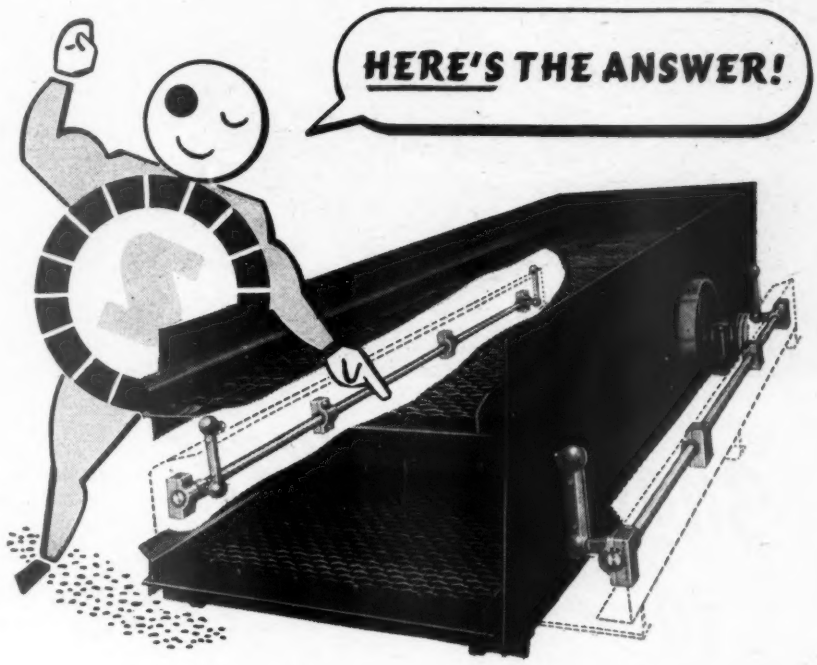
A new rock drill designated the "J-10 Utility Jackhamer" has been announced by Ingersoll-Rand. The lightweight, air-operated device has strong automatic rotation and uses standard jackbits. By



using adapters, star drills can be used to drill holes 1⅛-inches and smaller. A built-in oil reservoir in the handle supplies ample lubrication.

WHY!

more tons per hour with Seco vibrating screens



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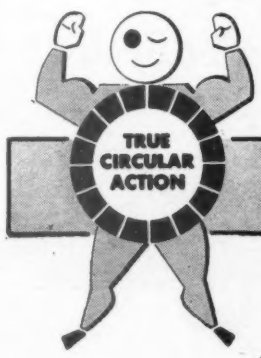
This Seco engineering exclusive *connects* the live screen body to the base frame at four points. Result, in operation, is a fully controlled true circular action that pays off in greater screening efficiency. Not only more tons per hour, but smooth, trouble-free performance is yours with a Seco Vibrating Screen. Seco builds over 250 models. Used and preferred on thousands of tough screening jobs coast to coast.

Write Dept. L for A Guide to Better Screening



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SCREEN EQUIPMENT COMPANY, INC.
PRODUCERS OF VIBRATING SCREENS EXCLUSIVELY
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Shows the way to Bigger Profits

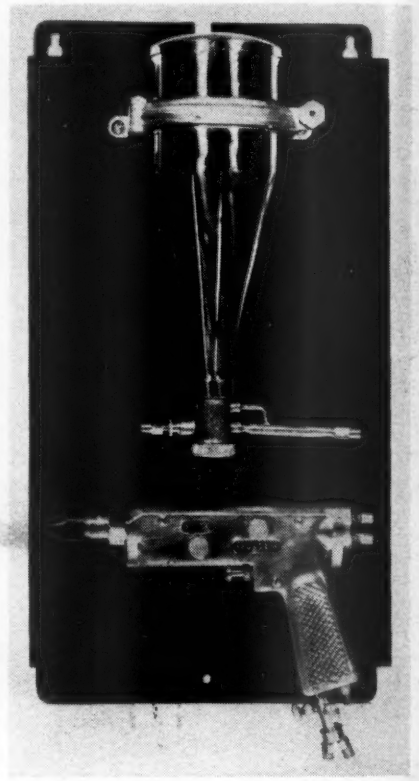
Whirl a walnut, tied on a string, against a hard surface. You quickly see the uniform breakage, and small power needs of breaking by *impact.* And that's how New Holland Double Impeller Breakers give you profitable stone reduction. Learn more about these bigger profits made possible by New Holland Dual Impact action. Ask your New Holland Distributor to show you "The New Stone Age" —a full color movie demonstrating the construction and operation of New Holland Double Impeller Breakers. Or, send a postcard today for the new, illustrated catalog.

NEW HOLLAND MANUFACTURING COMPANY
DIVISION
NEW HOLLAND MACHINE COMPANY
DEPT. R-7, MOUNTVILLE, PA.

● Metallizing Gun

The "Spraywelder" is a gun which sprays metallized powder on the work to be overlaid. This sprayed overlay is then bonded to the base metal by means of a large preheated torch, induction equipment or control atmosphere furnace.

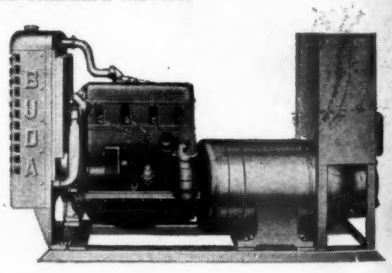
This Sprayweld process combines the



advantages of welding and metallizing procedure inasmuch as metallizing methods are used to apply thin uniform overlays to greater tolerances. Welding procedures are employed to fuse the overlay to the base metal. The Wall Colmonoy Corp., 714 Fisher Bldg., Detroit 3, Michigan.

● Gas-Electric Generator Set

The Buda Co. is now manufacturing a new line of gasoline electric generators sets in sizes from 10 kw. to 125 kw. These sets are designed for both standby and standard service.



These generator sets are available in 23 sizes and models, a.c. or d.c. output, single- or three-phase. The engines are water cooled and compactly built. Full circulating pressure lubrication is provided to all crankshaft bearings, rocker arm bearings, and rocker arm shaft. The generator is direct connected, of single ball bearing, drip-proof construction. The Buda Co., Harvey, Ill.

trade notes

● Semi-Portable Plant

A new crushing and screening plant announced by Pioneer Engineering Works meets the needs of the small quarry. The No. 55, a semi-portable plant, produces two sizes of aggregate and sand.

It is a compact hopper-fed plant, consisting of a jaw crusher, bucket elevator, and transfer conveyor—all mounted on a four-wheel trailer. The revolving screen is a complete unit, easily mounted on either steel or wood bin.

Weight of plant with 1016 jaw crusher and bin is approximately 26,000 pounds. A 20-cu.-yd., three-compartment bin is included with plant when specified. Capacity of the plant depends upon the size of aggregate required and the size of the jaw crusher, which is available in two standard sizes.

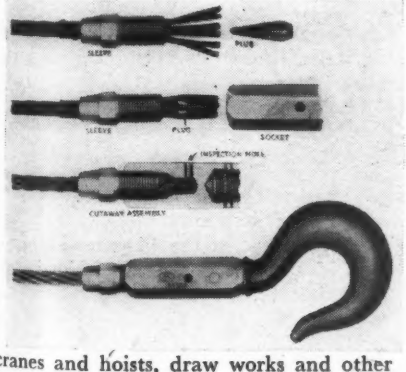
Size Crusher	Capacity 1½" Setting
1016	10—15 tons per hour
1024	15—25 tons per hour

A 50 continuous hp. gasoline or diesel power unit is mounted between the crusher and the bucket elevator. The plant includes multiple V-belt drive from the power unit to the jaw crusher, the drive from crusher to elevator, revolving screen, necessary hoppers and spouts for the operation of the complete plant.

● New Hook Fitting

The Electroline Company is introducing a new hook fitting which it is claimed will replace unsafe methods.

On truck-borne winches, overhead



cranes and hoists, draw works and other similar equipment, hooks may now be secured safely and quickly to the cable ends by means of the patented Fiege solderless connector which is built as an integral part of the hook. Applied with common tools and easily checked through an inspection hole, the assembly may be easily removed if desired.

The appointment of John E. Heuser as assistant sales manager of the Le Roi Company has been announced by John M. Dolan, vice-president in charge of sales for the Milwaukee company. He will discharge some of the duties of Cecil W. Brown, who recently resigned as general sales manager.

J. E. Heuser

During the last three years Mr. Heuser has handled much of the sales administration for both Le Roi engine and compressor products.

1948 will be a record year for trade shows and expositions, according to the Exhibitors Advisory Council, Inc., New York, whose annual schedule lists more events than ever before in the history of the organization.

J. F. Apsey Jr., advertising manager of The Black & Decker Manufacturing Company, Towson, Md., is president of the council, which is a non-profit body founded to help manufacturers obtain maximum results from their exhibit dollars. Among the directors are the following: F. J. Maple, advertising manager, John A. Roebling's Sons Co., Trenton, N. J.; D. C. Miner, advertising manager, E. F. Houghton & Co., Philadelphia; C. F. Radley, director of publicity, Oakite Products, Inc., New York; and W. F. Uffelman, manager of exhibits, E. I. du Pont de Nemours & Co., Wilmington, Del.

C. E. Lacy, Allis-Chalmers sales representative, has been transferred from the company's Atlanta office to its Birmingham office, where he will concentrate on the sale of products of the basic industries department.

After nearly seven years as executive secretary of Associated Equipment Distributors, C. F. Winchester resigned his position with the trade body and is now engaged as Washington representative for American Conveyor Co., Chicago, Ill.; Fontaine Truck Equipment Co., Inc., Birmingham, Ala.; Gar-Bro Manufacturing Co., Los Angeles, Calif.; Insley Manufacturing Corp., Indianapolis, Ind., and New Holland Manufacturing Co., Mountville, Pa.

Milton E. Army, southern California representative of Lima Locomotive Works, Shovel Division, died recently after suffering a heart a heart seizure. His headquarters were at the Smith Booth Usher Company, Los Angeles.

Irl A. Daffin, farm and industrial equipment manufacturer, has purchased Lancaster Engineering Corporation, Lancaster, Pa. Expansion plans were announced by Mr. Daffin, who has become president of the company. The Lancaster concern is a manufacturer and distributor of industrial type hammer mills and other heavy equipment.

Syntron Company, Homer City, Pa., manufacturers of vibratory materials-handling equipment and portable construction and maintenance tools, has purchased the former H. K. Porter Company shell plant at Blairsville, Pa., 12 miles from Homer City.

Appointment of the St. Louis Railway Supply Company, St. Louis, Missouri, as a distributor of Robins Conveyors Division equipment in the general St. Louis area, was announced by J. H. Hayden, vice-president in charge of sales, of Hewitt-Robins Inc.

The St. Louis company will specialize in sales and distribution of the Robins Car Shakeout, a portable electric-powered materials-handling machine.

Harry F. Brown was recently appointed general manager of the E. I. du Pont de Nemours & Company's explosives department and Samuel G. Baker general manager of the electro-chemicals department.

H. F. Brown

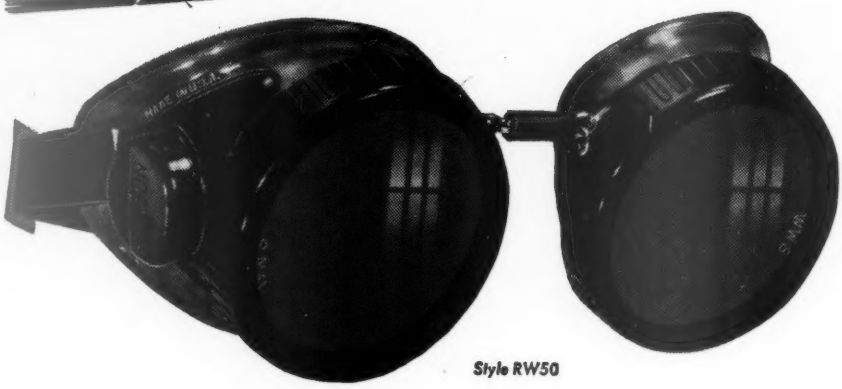
Mr. Brown succeeds William H. Ward, who was recently elected a vice-president of the firm. Mr. Baker succeeds F. S. MacGregor, whose retirement took place in December.

Bailey Meter Co., Cleveland, O., has opened new branch offices in New Orleans and Schenectady. The company manufactures and applies measuring and controlling equipment for steam power plants and industrial processes. S. G. Dukelow, manager, and J. M. Bevan, service engineer, are in charge at New Orleans. J. F. Luhrs is branch manager at Schenectady.

In the Glare of the Torch— think of WILLSON

Style CW60

ROOM WANTED FOR SPECTACLES? . . . There's comfort for wearers of prescription glasses in Willson Cover-Alls.* And the adjustable leather bridge rests lightly on the nose without pressure. Willson-Weld* lenses in the shade you specify, of course.



Style RW50

GAS WELDERS GO FOR IT . . . Assured protection of Willson-Weld lenses and comfortable face fit make this goggle day-in, day-out favorite for flame cutting and cleaning as well as welding. Indirect ventilating ports exclude glare.

Style DC50

FOR EYES THAT LEAD A DOUBLE LIFE . . . From welding to chipping with a flip of the wrist! Willson-Weld lenses in separate frames flip up to leave eyes protected by clear, Super-Tough* lenses.

For complete information on these products and their application, as well as many more eye and respiratory protective devices, get in touch with your nearest Willson distributor or write us direct.

*Reg. U. S. Pat. Off.

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DOUBLE WILLSON PRODUCTS INCORPORATED

Established 1870

102 THORN STREET • READING, PA.

In line with its expanded sales and manufacturing program, Thermoid Company, Trenton, N. J., has announced the following personnel changes:

Jack Brand, formerly assistant sales manager for Thermoid's Automotive Replacement Division at Trenton, will handle industrial sales for the state of Colorado, with headquarters at Denver. J. J. Chamberlain, formerly associated with Pioneer Rubber Mills of California and the Rubber Division of Paramount Manufacturing Company, will handle industrial sales in the state of Washington and the northern half of Oregon, with headquarters in Seattle.

E. J. Dunlap has been transferred from Trenton, N. J., where he headed industrial sales promotion, to San Francisco, Cal., where he will have charge of industrial sales for the northern half of California and southern Oregon. A. Fred Matheis, who has been in industrial sales with Thermoid at Trenton headquarters for 20 years, assumes the duties of industrial sales promotion manager.

H. William Overman, manager, Industrial Friction Materials Division, has transferred his headquarters to the Thermoid office at 422 Boulevard Building, Detroit, Mich. Jack Wright, who will headquarter at Salt Lake City, Utah, has been assigned industrial and oil field sales in Utah, Idaho, Wyoming, Montana and Western Canada.

R. W. Maxwell has been promoted to assistant branch manager of the Buffalo motor truck branch, International Harvester Co. Mr. Maxwell, formerly manager at Binghamton, N. Y., started his career with Harvester at Columbus, Ohio, in 1926.

J. F. Adams, formerly assistant manager of the Charlotte motor truck branch, has been transferred to the Nashville motor truck branch as manager, succeeding J. P. Lauffer, who has resigned to enter business as an International truck dealer at Columbia, Tenn.

T. N. Barksdale, until recently in charge of Bemis Bro. Bag Company's Baltimore sales office, has assumed new sales responsibilities at the Bemis Memphis Sales Division. This office covers all of Tennessee and Mississippi and portions of five other states.

Ray Perin, of the Ira G. Perin Co., for 35 years the West Coast representative for Elwell-Parker trucks, has been elected president of the 14-year old Materials Handling Association of Northern California.

Hercules Powder Company has announced the appointment of L. C. LeBron as assistant manager of its explosives department's contractors division at Wilmington, Del., effective January 1, 1948. Mr. LeBron joined Hercules on May 1, 1927, as a member of the company's sales and service organization at Birmingham, Ala.

E. M. Proctor

Elwood M. Proctor has been appointed manager of the Bemis Bro. Bag Co. plant in Seattle, Wash. He replaces E. J. Gregg, who died recently. Mr. Proctor joined Bemis in 1926 as a member of the Engineering Department in St. Louis. He became manager of Bemis open - mesh sales in 1939. More recently he has been in charge of burlap and open-mesh bag sales at the St. Louis general sales office.

J. J. Hite

R. J. Stoddard, chief engineer of the American Hoist & Derrick Company, announced the promotion of Joseph J. Hite to the post of assistant chief engineer.

Mr. Hite, who started with American Hoist in 1936, formerly held the position of development engineer and more recently of office engineer. He has a broad background in the engineering phases of material handling equipment.

A. E. Chapman, president of Central Bag & Burlap Company, Chicago, has announced the appointment of John R. Clements as sales manager. Mr. Chapman was formerly with the Chicago office of the Bemis Bro. Bag Company.

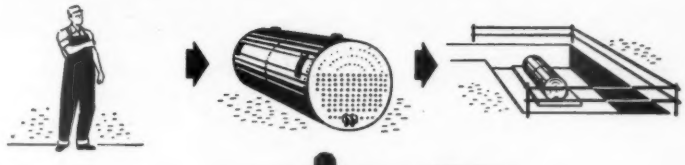
Joseph T. Ryerson & Son, Inc., distributors of steel from stock, have announced the appointment of Alfred J. Olson as an assistant sales manager of their Chicago plant. He succeeds Ray C. Page, who was recently named sales manager of the company's new steel service plant under construction in the San Francisco area.

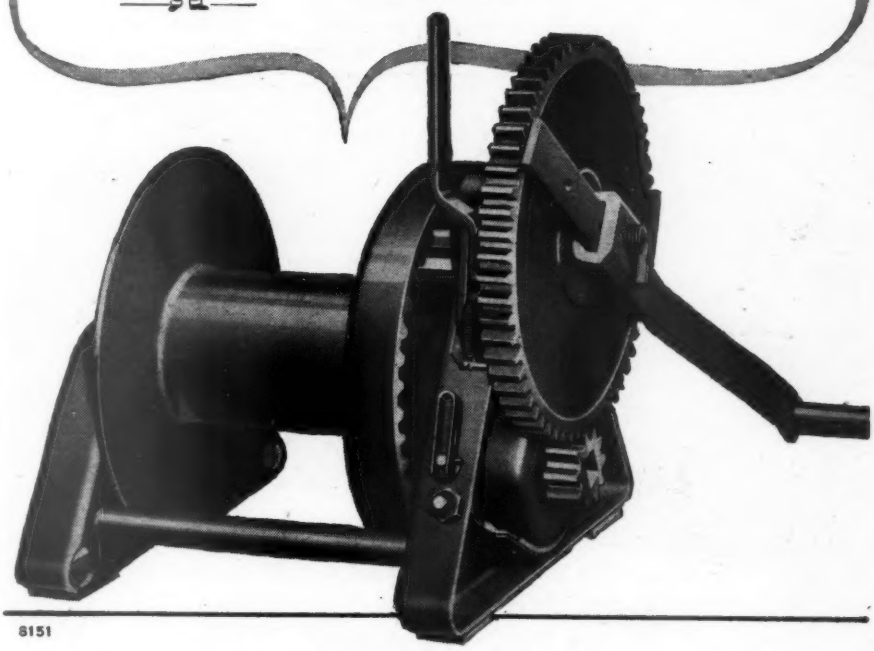
Marion Power Shovel Company of Marion, O., announces the appointment of William F. Lanius as sales representative at Portland, Ore., succeeding Joseph Reed, who had represented the company in that territory for the past seven years. Mr. Lanius' territory will consist of Washington, Oregon, Idaho and Montana.

William M. Wallace has been named special assistant to G. V. Woody, manager of the Allis-Chalmers basic industries department. Mr. Wallace served as a sales representative in the company's Denver and Pittsburgh district offices, and more recently as an engineer in the basic industries department.

Would you believe . . .

that one man, with no power equipment . . . can haul this heavy boiler . . . out of this deep pit?





8151

The job's a cinch . . . with HANDIWINCH

● It's easy as **ABC** . . . here's how he'd do it . . .

(A) Carries HANDIWINCH to the job. (B) Sets it up on any firm support. (C) Anchors it. (D) Using planks for a ramp, he fastens rope to boiler and hauls it up and out.

Stoutest, most ingenious small winch ever built, HANDIWINCH and *one man* can handle any lifting or pulling job up to 10,000 lbs. All steel construction . . . cut gears . . . two power ratios . . . powerful hand brake . . . many "big hoist" features.

Ask your distributor . . . or write direct for folder HW-15, showing many typical HANDIWINCH set-ups.

American Hoist and DERRICK COMPANY

Plant No. 2: So. Kearny, N.J.

St. Paul 1, Minnesota

Sales Offices:

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For Armored Construction . . . specify **AMERICAN BLOCKS AND SHEAVES**

A wide line of wire rope blocks—many types, all sizes, in capacities from 1½ to 250 tons. Thick steel side plates, heavy pins and axles. Ask for American equipment when ordering.

For fastening wire rope, use genuine **CROSBY CLIPS**

Hot dip galvanized—high wings—grooved saddle—precision cut threads. To make sure you get genuine CROSBY CLIPS, look for the famous Red U-Bolt. All sizes—⅛ to 3 inches. Distributors everywhere.

legal decisions

By LEO T. PARKER

A few days ago we received an interesting letter from a reader, as follows: "When does a lease include sand and gravel? We have a law suit. We leased our land. The lease contains a clause that the lessee has the right to 'all oil, gas, coal, and other "minerals" in and under and produced' from the land described in the lease contract. The lessee wants to remove sand and gravel from this property. Can he do it? We say not. Please cite some cases to help us win the suit."

According to a recent higher court your lease contract does *not* give the lessee any rights to sand and gravel.

For example, in *Winsett v. Watson,* 206 S. W. (2d) 656, reported February, 1948, the testimony showed facts, as follows: One Winsett obtained a lease from a land owner. The lease contained a clause that the lessee had "the right of ingress and egress at all times for the purpose of mining, drilling and exploring said land for oil, gas and other minerals, and removing same therefrom."

The lessee decided to take sand and gravel from the land. The higher court held that he could *not* do so, saying:

"The precise question before us is, whether a conveyance of oil, gas and *other minerals* includes sand and gravel. . . . We believe the conveyance or reservation does *not* include gravel, although there is on the real property sand or gravel susceptible of commercial production and use."

Also, see the leading case of *State v. Hendrix,* 167 Pac. (2d) 63, where it was held that gravel was not included in a conveyance of "oil, petroleum, gas, coal, asphalt and all other minerals."

And in *Shell Petroleum Corp. v. Liberty Gravel & Sand Co.,* Tex. Civ. App., 128 S. W. (2d) 471, the higher court held that sand and gravel were *not* conveyed by a lease granting the oil, gas and other minerals in certain land.

Also, see *Lillington Stone Company v. Maxwell,* 203 N. C. 151, 165 S. E. 351, where the court held that digging of gravel for commercial purposes is not "mining."

See also *Holloway Gravel Company v. McKowen,* 200 La. 917. This court held that under *ordinary* circumstances "mineral rights" do *not* include sand and gravel. However, the term *may* include sand and gravel if the lessee proves that, before the lease was signed, it was *verbally* understood between the lessee and lessor that the term "minerals" was *intended* to include sand and gravel.

See *Puget Mill Co. v. Duecy,* 96 Pac. (2d) 571. This court said the word "minerals" is not a definite term, and that it is susceptible of limitations or extensions, according to the *intention* of the lessor and lessee.

Jury May Decide

Under no circumstances will a higher court deny the right of a jury to decide a controversy unless a valid contract *clearly* gives another the legal right to finally decide the rights and liabilities of the litigants.

For example, in *Shore v. Wallace,* 186 Pac. (2d) 581, the testimony showed facts, as follows: A contractor had a contract with the Water Supply and Storage Company to rip-rap the face of a dam with rock and spall two feet thick. The contractor contracted with a quarry owner to load the rock and spall on trucks at a quarry. The written agreement provided that the contractor would contract between plaintiff and defendant Shore with respect to said work, was

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prepared by Shore and signed by the plaintiff May 22, 1945, after he had begun the work of loading said rock and spall. Section 4 of said contract is as follows: Pay to the quarry owner for the loading and hauling of the rock and spall, $1.25 per cubic yard measurement *of the engineer* of the Water Supply and Storage Company. On measurement by the engineer of the Water Supply and Storage Company the cubic yardage actually distributed two feet deep on the face of the dam was only 5622 cubic yards. However, the contractor claimed that he had $1,970 due for more material than estimated by the engineer.

The jury held that the contractor could recover $1,970. The higher court upheld the jury's verdict because the contract did not provide that the engineer's estimates should be *conclusive* and therefore the engineer's cubic yard measurements and his estimates could be varied by the jury after listening to all testimony.

Customer Careless

Modern higher courts consistently hold that no person who sustains an injury through his own carelessness can recover damages.

For example, in *Smith v. Simon's Supply Company, Inc.*, 76 N. E. (2d) 10, it was shown that a customer went to a dealer to buy some patching plaster. A clerk of the dealer told him that cement would be better, and directed him to go to the cellar, where he would find cement and sand, and could make the mixture himself. The customer went down a stairway toward the cellar.

The light on the stairs was dim, and was insufficient to permit the customer to see where he was stepping. He "stepped on something uneven and then stepped forward with the other foot to gain his balance and stepped off into space. . . . At the time when it happened, he was unable to see where he was stepping because of the lighting conditions at that point." He fell to the cellar floor, and sustained severe injuries. He sued the cement dealer for damages.

The higher court refused to allow the customer any damages, and said:

"He found himself in the dark, in a place strange to him, and unable to see where he was stepping. Instead of returning to the street floor, he attempted to grope his way down a strange flight of stairs. We think that his conduct amounted to contributory negligence, and bars him from recovering."

Wants Advice

Recently a reader wrote as follows: "I have a disease known as silicosis caused by breathing dust. The doctors say I contracted this disease January 5, 1945, while working for the White Company. But I stopped work because of the disease December 1, 1947, while working for the Willis Company. Whom must I sue for compensation, as both companies refuse payment?"

By special letter this reader received legal information, as follows:

See *Employers' Liability Assur. Cor-*

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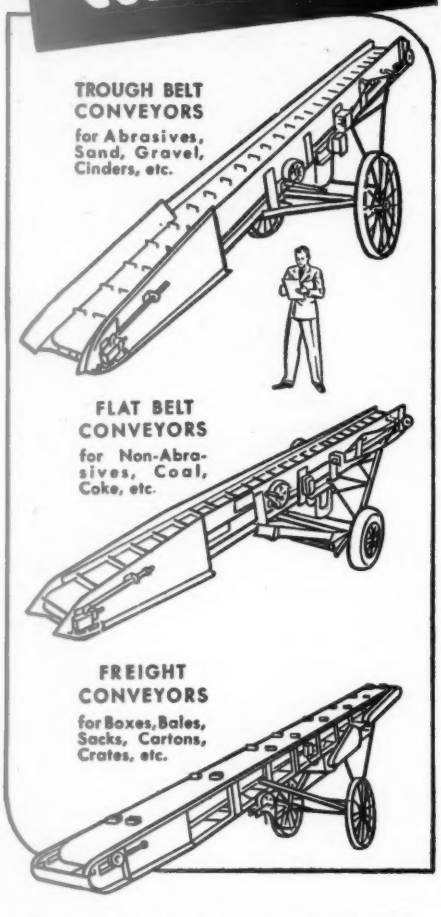
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poration v. Merritt, 75 N. E. (2d) 803, reported February, 1948. The higher court held that the last day of the exposure renders the employer liable for compensation due to the occupational disease known as silicosis.

In this case the testimony showed that October 7, 1944, was the last day of the exposure to silicosis but intermittently between November 30, 1943, and October 7, 1944, the employee lost some days from work because of the illness. Also, the employee did some work for another employer after October 7, but he was not "exposed" to the disease. Hence, the higher court held that his employer on October 7 is responsible for payment of compensation.

Sanitation Law

All modern courts consistently hold that the preservation of public health from danger resulting from the accumulation of sewage is important. Hence, it is useless for any company to contest the validity of a law or order for sewage, if a state law authorizes the improvement.

For illustration, in *Fort Howard Company v. Town of Ashwaubenon,* 26 N. W. (2d) 661, it was shown that a state law authorizes municipalities to create sanitary improvements. A municipal sewage board assessed private property including large tract of land owned by the Fort Howard Company. This company filed suit to prevent the board from collecting assessments on its property, proving that the costs greatly exceeded the benefits. However, the higher court refused to interfere with the board's order, saying:

". . . . . It is difficult to see how benefit to property due to the organization of a sanitary sewerage district to promote the public health and welfare can be apportioned other than on the basis of area or linear foot extent of the property. It is manifest from the proceedings in this case that the property of the plaintiff (Fort Howard Company) will be benefited because the lands are within the watershed and may be served by the proposed improvement."

Scope of Employment

According to a recent higher court an injury or death is compensable under the State Workmen's Compensation Act caused by lightning while the employee is attending to his regular duties.

For example, in *Gilstrap v. Industrial Accident Commission,* 175 Pac. (2d) 884, it was shown that when an employee was working on the roof he was struck by a bolt of lightning, which caused his death. His dependents sued his employer, a contractor, for compensation under the State Workmen's Compensation Act. The higher court awarded compensation, saying:

"Harm resulting from lightning may be compensable as an injury arising out of and in the course of the employment, where the injured employee is by reason of his employment peculiarly exposed to risk of injury from this source."

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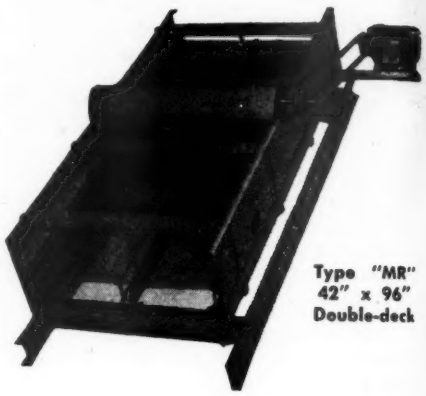

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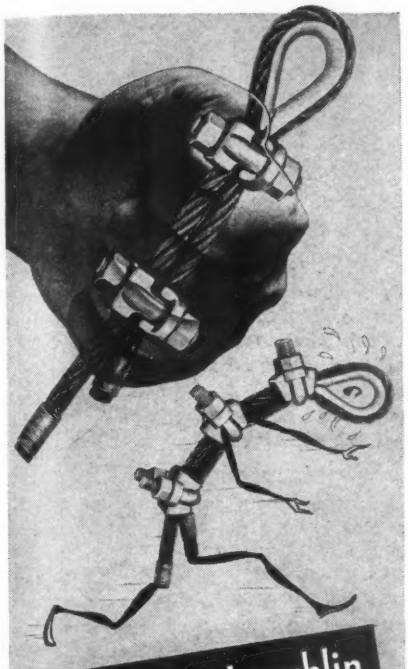

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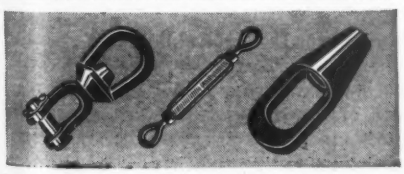

Old Injury Aggravated

According to a recent higher court if an old injury or sickness is aggravated by a *new* injury the employee can recover *full* compensation for *both* the old and new injury.

In *Olin, Inc., v. Industrial Commission,* 69 N. E. (2d) 305, it was shown that an employee sustained a back injury which aggravated an old injury.

This court laid down important law that where an employee has a pre-existing malady which is aggravated by a new accidental injury, the employee is entitled to full compensation under the State Workmen's Compensation Act for the disability caused by both injuries.

For comparison, see *Guthrie v. Texas Employers' Ins. Ass'n.* 199 S. W. (2d) 685. Here an employee sued to recover compensation for total and permanent disability. The evidence showed that in the morning the employee became too hot. Soon afterward he became sick at his stomach, vomited and went outside to cool off. The employee went home, where he continued to cough through the afternoon and night. He worked most of the time during the next month but was ill and confined to his bed several days during the month. It developed that he had tuberculosis. The higher court refused to award the employee any compensation, saying:

"In order to recover under the compensation law, actual physical injury, internal or external, must be shown before an inference legally may be drawn that the final result in respect to which compensation is claimed is attributable to an injury originating in the employment."

Also, see *Jackson,* 265 S. W. 1029. In that case, the employee was exposed to severe weather conditions from which he developed a cold and pneumonia resulted. The court said:

"While the disease was the natural result of getting wet, the mere getting wet was not a 'damage or harm to the physical structure of the body,' and, unless it was, it could not be said to be an 'injury' or 'personal injury,' for which compensation is allowed."

Veterans' Employment

Considerable discussion has arisen from time to time over the legal question: Can a discharged veteran compel his former employer to give him exactly the same job he had before joining the military service?

According to a recent higher court military service should entail no greater setback in the private pursuit or career of the returning soldier than is unavoidable. Hence a veteran is thus protected from receiving a job inferior to that which he had before entering the armed services.

For example, in *Bozar v. Central Pennsylvania Quarry & Construction Company,* 73 Fed. Supp. 803, the testimony showed facts, as follows: An employee named Bozar was employed by the Central Pennsylvania Quarry and Construction Company on February 8, 1944, as a truck driver at Hauto, Pa., until he

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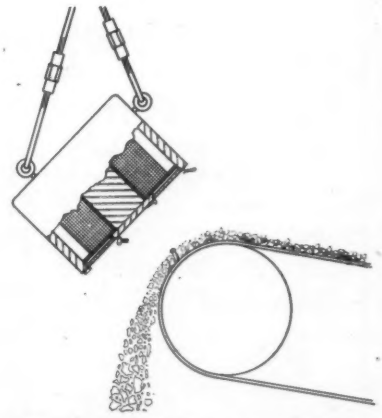

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was inducted into the army on March 23, 1944. He served in the army until January 17, 1946. Within eight days of his discharge he applied to the quarry company for restoration to his former position. He was offered a position as truck driver on a job in Ashland, Pa. The employee refused to accept the offer of employment and insisted on being engaged to work in the same city where he had formerly worked, Hauto, Pa.

It seems that the employee was ineligible for the former job in Hauto because he was not a member of a union on this job. The employer explained that he could not discharge an employee of the union and engage the employee in his place. The Federal Court held:

"Under the circumstances, we hold that the demand of the petitioner (employee) was unreasonable and not within the rights guaranteed to him by the Act. He should have accepted the position offered to him by respondent (employer). . . . Seniority rights under collective bargaining agreements may not be impeached by individual contracts."

Fair Labor Standards Act

All courts hold that employees are within the scope of the Fair Labor Standards Act who "further" interstate commerce.

For example, in *Clark v. E. C. Schroeder Company, Inc.*, 73 Fed. Supp. 1007, certain mechanics, laborers, power shovel operators and drivers of trucks hauling rock from a quarry sued their employer for back wages, penalties, and attorney fees under the Fair Labor Standards Act.

The testimony showed that these employees performed work necessary for production of merchandise used in interstate commerce. Therefore, the Federal Court held in favor of the employees.

No Excuse

The fact that materials or equipment is scarce is no good excuse to avoid damage liability.

In *Schon v. James,* 28 So. (2d) 531, the testimony showed that a water heater leaked and damaged merchandise stored by another tenant on a lower floor.

The owner of the spoiled merchandise sued for damages. During the trial a plumber clearly testified to the effect that the heater had not been replaced because a new one could not be obtained.

Nevertheless, the higher court allowed damages. This court said:

"It is obvious to us that the heater was in very bad condition. . . . The true cause of the loss here was a worn out heater. The defendant continued to operate it at his peril."

Insurance Loss

According to a recent higher court taxes on income derived from insurance are void.

In *Independent v. Howard,* 204 S. W. (2d) 810, it was shown that certain equipment was destroyed by fire. The owner collected from an insurance company $24,274 indemnity for its loss. In making out income tax returns he omitted listing the collected insurance.

In subsequent litigation, however, the higher court held property destroyed by fire is neither sold nor exchanged. Hence the proceeds of fire insurance are *not* taxable gains.

CENTRAL FREIGHT ASSOCIATION TARIFF

Docket 84701—It is proposed to establish on limestone, ground or pulverized, unburned, carload minimum weight 60,000 pounds, from Conneaut, O., to Fostoria, O., 193 cents per net ton, subject to Ex Parte 162 and 166 increases.

Docket 84774 (2)—It is proposed to establish on stone, viz: fluxing, furnace, foundry, melting or refractory, unburned, in bulk, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Marengo and Milltown, Ind., to Middletown, O., 152 cents per gross ton, subject to Ex Parte 162 and 166 increases.

Docket 84797 (2)—Proposed to establish on limestone, ground, or pulverized, carload minimum weight 60,000 pounds, from Hillsville and Shaw Junction, Pa., to Ligonier, Pa., 165 cents per net ton, subject to Ex Parte 162 and 166 increases.

Docket 84807 (2)—Crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when loaded to full cubical or visible capacity, actual weight will apply. Establish on from Georgia, Ind., to Mt. Carmel, Maud, Belmont, Browns, Albion, Ellery, Golden Gate, Merriam, Boyleston, Sims, Wayne City, Keehao, Bluford, Marlowe, Mt. Vernon, Dix, Walnut Hill and Centralia, Ill., 139 cents net ton, subject to increase under Ex Parte 162 and 166.

PACIFIC FREIGHT TARIFF BUREAU PROPOSALS

Docket L-2385 (Shipper)—Ground limestone, in closed cars, both in bulk and in paper bags, carload from Victorville, Calif. Request for rate of 19½ cents per hundredweight to Phoenix and 21½ cents per hundredweight to Tucson, Ariz., minimum weight 50,000 pounds; also rate of 19½ cents per hundredweight, minimum 80,000 pounds, to Tucson with partial unloading privilege at Phoenix.

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC 511-668—(A) Stone, crushed or ground, chats, riprap and rubble, in open-top cars, carload. (B) Agricultural limestone, in bulk in open-top cars, carload, from Grafton, Ill., to stations in Illinois on N.Y.C.&ST.L.R.R.

Proposed Rates To (Representative)	Crushed Stone Description A	Agricultural Limestone Description B
Humrick, Ill.	204	175
Mortimer, Ill.	191	171
Brocton, Ill.	191	157
Rardin, Ill.	177	157
Charleston, Ill.	177	133
Kingman, Ill.	164	119
Herrick, Ill.	133	119
Bayle, Ill.	119	106
Alhambra, Ill.	92	91

Rates subject to Ex Parte 162 and 166 increases.
Present rates: None in effect.

TRUNK LINE ASSOCIATION DOCKET

Docket 44661 (Shippers)—Crude gypsum rock, carloads, minimum weight 90 percent of marked capacity of car, but not less than 80,000 pounds, from Baltimore, Md., to Bath, Bath Junction, Brodhead, Hercules, Martins Creek, Nazareth, Penn Allen, Sandts Eddy and Navarro (Northampton) Pa., $2.26 per net ton, in lieu of current sixth class rates. Subject to Tariff of Increased Rates and Charges No. X-162-A and Tariff of Emergency Charges No. X-166, amendments thereto and reissues thereof. Reason: Comparable with rates applying to other points.

Docket 44670 (Shippers)—Crude gypsum rock, carloads, minimum weight 90 percent of marked capacity of car used but not less than 80,000 pounds, from New Brighton, N. Y., to Jamesville, N. Y., $2.42 per net ton (rate does not include cost of loading cars), in lieu of current sixth class rate of 28 cents per 100 pounds (subject to E-162-A and X-166-A, amendments thereto and reissues thereof). Reason: On same basis as rates applying from and to other points.

Docket 44682—Limestone, ground or pulverized and stone dust, carload minimum weight 60,000 pounds from Kimballton and Ripplemead, Va., to various stations on Baltimore and Annapolis R.R. Baltimore & Eastern R.R., B.&O. R.R., Monongahela Ry., N.Y.C. R.R., P.R.R., Virginian Ry., and W.Md. Ry. in Trunk Line and Border territories, rates on basis of Interstate Commerce Commission docket 25220 Carriers Revised Scale. (Subject to Tariff of Increased Rates and Charges No. X-162-A and Tariff of Emergency Charges No. X-166, amendments thereto or reissues thereof.) Reason: On same basis as rates applying from and to other points.

WESTERN TRUNK LINE

Docket X-E-41-923—It is proposed to establish on stone, crushed, carload from Morris, Kan., to Naponee, Neb., $2.10 per net ton.

Docket X-E-41-928—It is proposed to establish on stone, crushed or ground, in open-top equipment a rate of 63 cents per net ton, from Huntington, Mo., to Bluffs, Ill., subject to Ex Parte 166 increase.

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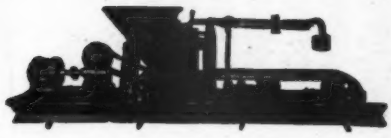

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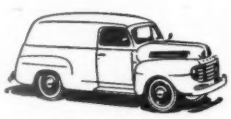

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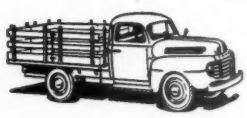

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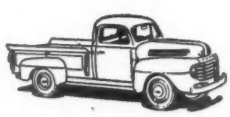

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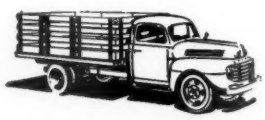
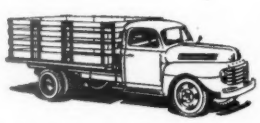
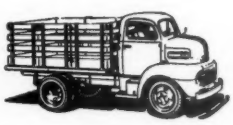


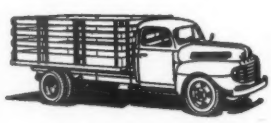
F-4—7,500 lbs. GVW. (singles), 10,000 lbs. (duals). 9′ Platform or Stake. 134″ w.b. V-8 or 6.



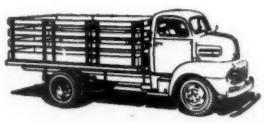
F-5—14,000 lbs. GVW. 9′ & 12′ Platforms or Stakes. 134″ w.b. & 158″ w.b. V-8 or Six engine.



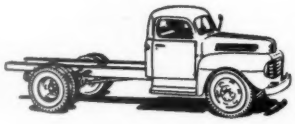
F-5 C.O.E.—14,000 lbs. GVW. 9′ & 12′ Platforms or Stakes. 110″-134″-158″ w.b. V-8 or Six.



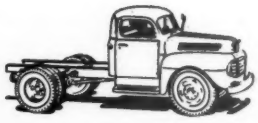
F-6—15,500 lbs. GVW. 9′ & 12′ Platforms or Stakes. 134″ w.b. & 158″ w.b. V-8 or Six engine.



F-6 C.O.E.—16,000 lbs. GVW. 9′ & 12′ Platforms or Stakes. 110″-134″-158″ w.b. V-8 or Six.



F-7—19,000 lbs. GVW. 135″-159″-195″ w.b. 9.00-20 maximum tires. 145 h.p. V-8 engine.



F-8—21,500 lbs. GVW. 135″-159″-195″ w.b. 10.00-20 tires. 2-speed axle. 145 h.p. engine.

NEW! Three new truck engines . . . a new Six and two new V-8's developing up to 145 horsepower!

NEW! Living room comfort in the new Ford Million Dollar truck cab! New seats. New 3-way air control.

NEW! Two new BIG JOBS rated to carry gross vehicle weights up to 21,500 lbs.!

SEE YOUR FRIENDLY FORD DEALER TODAY!

FORD 1948 *Bonus Built* TRUCKS 1948

BUILT STRONGER TO LAST LONGER

*BONUS: *"Something given in addition to what is usual or strictly due."—Webster*

LIFE INSURANCE EXPERTS PROVE AND CERTIFY . . . FORD TRUCKS LAST UP TO 19.6% LONGER!

NEWS OF CONCRETE MANUFACTURERS

C. E. Ehle, Past President Of N.C.M. Assn., Dies At New York Convention

On the eve of the 28th annual convention of the National Concrete Masonry Association at New York, Clarence E. Ehle died suddenly in his room at the Hotel New Yorker. He was long

Clarence E. Ehle

one of the leading figures both in the association, which he served as president several years ago, and in the products industry.

Mr. Ehle became engaged in the concrete block business in 1912, when he founded his own firm, the Rocky River Cement Block Company in Cleveland, O. He sold this business in 1916 and built the City Concrete Block Company, which was one of the largest of such concerns in Cleveland when he sold out in 1919 to the Cleveland Builders Supply Company. Mr. Ehle remained with the business and became general superintendent and later operating manager, as well as a director and vice-president. While he held the post of operating manager, he had charge of all operations and also acted as negotiator of all labor contracts for the building material industry in Cleveland. He numbered many labor leaders among his friends.

During World War II he set up and supervised all out-of-town concrete projects for the company, for which a total of 1,000,000 cubic yards of ready-mixed concrete was poured. Among these jobs was the Ravenna (O.) arsenal, where he inaugurated the idea of placing ready-mix drums on flat cars and pouring in inaccessible spots. About 350,000 cubic yards was poured at Ravenna. At Sault Ste. Marie, Mich., he poured concrete at 33 degrees below zero for the MacArthur Lock. Other such projects were the Carbondale (Ill.) arsenal, the Baraboo (Wis.) arsenal and the Cleveland bomber plant.

In 1945 Mr. Ehle left the Cleveland Builders Supply Company to become vice-president and general manager of the Indiana Limestone Co. He later was president of the firm. While he was at Bedford, he helped reorganize the Limestone Institute.

Two years later he left the Indiana Limestone Company and attacked the lightweight aggregate problem as manager of the Sinterlite Department of the Stearns Manufacturing Company at Adrian, Mich. He was engaged in this work at the time of his death. Mr. Ehle was 56 years of age.

Ozark Products Men Hold First Annual Convention

The Ozark Concrete Products Manufacturers, organized early in 1947, are planning their first annual convention, to be held in Springfield, Mo., on April 10.

E. George Rhodius, president, of Springfield, and Doyle Davis, secretary, of Carthage, have announced that a full program has been arranged, including such prominent speakers as H. K. Shideler, who will speak on precast units; George Kulhavy, Carter-Waters Co. of Kansas City, who will discuss lightweight aggregates and blocks; and E. W. Dienhart, National Concrete Masonry Assn. executive secretary.

The afternoon business meeting and discussions will be topped off with a banquet for members and guests. Carl Weber of Laclede Steel Company, will be the speaker and W. G. Ruckle of Springfield, will serve as toastmaster.

Wallace T. Smith, former manager and co-owner of the Concrete Products Company of Metropolis, Ill., has accepted a position with the Metropolitan Life Insurance Company.

Coming Events

July 16-24, 1948—Chicago. Convention and Road Show, American Road Builders Association, Soldiers Field.

September 20, 1948 — Colorado Springs. Directors' meeting, National Ready Mixed Concrete Association, The Broadmoor.

Universal Concrete Pipe Inaugurates Plan for Employee Group Insurance

An all-inclusive group insurance plan has been made available to all employees of the Universal Concrete Pipe Company, which has its headquarters in Columbus, O.

Benefits under the plan include life insurance, sickness, accident, hospitalization and surgical payment coverage.

President H. X. Eschenbrenner, in his letter to the 450 employees, said that the insurance will run as low as 54 cents a week for workers without dependents. Those having dependents will pay from 97 cents a week upward in proportion to the number of dependents and amount of life insurance taken.

Policies will be underwritten by the Etna Life Insurance Company.

Eugene Garrett Sole Owner Of Mt. Carmel Block Plant

Eugene Garrett, formerly a co-owner of the Mt. Carmel Concrete Block Company, Mt. Carmel, Ill., has purchased the interest of his partner, the Rev. Mr. Harold Carter, who now makes his home in East Alton. (In the absence of Mr. Garrett during World War II the business was operated by Mr. Carter.)

With several pieces of new equipment replacing worn out machines and the addition of a new steam treating system, Mr. Garrett expects soon to increase the present output of the plant.

Higgins Resources Announces New Concrete Building Material

Andrew Higgins, head of Higgins Resources, Inc., of New Orleans, La., has announced the development of "Thermocon," a new building material made of cement, water and a secret foaming agent.

Poured into plywood forms, the material hardens and becomes a light-weight cellular concrete suitable for use in constructing walls, roofs and partitions.

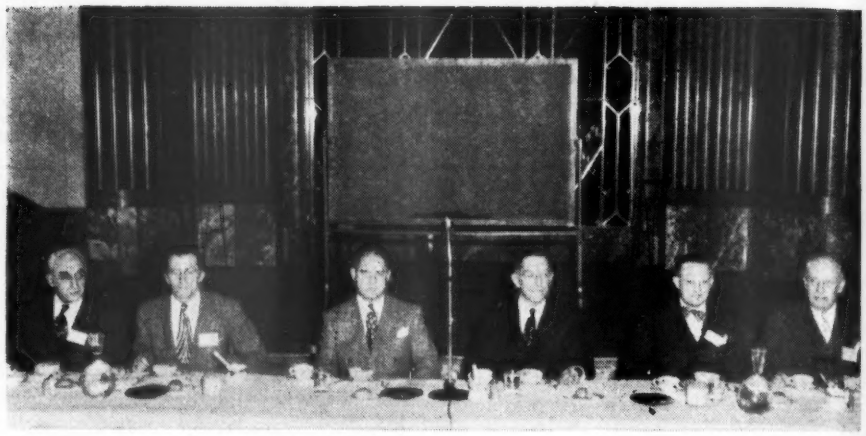
The Longview (Tex.) Sand and Gravel Company has announced the addition of ready-mixed concrete to its products, according to a recent announcement. Three big Jaeger transit mix trucks have been added to the firm's equipment as a nucleus of the new operation. Mr. and Mrs. Luther Johnston and Aubrey Johnston are the owners.

L. C. Pender, who was for 20 years the western Michigan representative for the Peerless Portland Cement Corporation of Detroit, has become associated with Michigan Certified Concrete Products, Inc.

California Masonry Assn. Elects J. A. Allen President At Annual Meeting

J. A. Allen, Hollostone Co., North Hollywood, Calif., was re-elected president of the Concrete Masonry Manufacturers' Assn. of Southern California at the annual meeting of the group, held at the Jonathan Club in Los Angeles on February 24. Other officers for 1948 include C. P. Cady, vice-president, and J. H. Kennington, secretary-treasurer. The new board of directors consists of L. B. Garber, M. H. Simovich, Stanley Ward, E. P. Ripley, Charles Wailes, and Homer C. Shirley.

Announcement was made of the admission of the following new members: Pre-Cast Concrete Products Co., Long Beach; Rocklite Products, Ventura; and six Bakersfield concerns—Concrete Products & Equipt. Co., Perma-Tile Concrete Products Co., Kite Bros. Lightweight Tile Co., Bakersfield Concrete Block & Products Co., Fewell Concrete Products Co., and the Valley Cement Tile & Brick Co.



• At the speakers' table during a luncheon meeting of the Ohio Ready Mixed Concrete Assn. were, left to right: Ernest Horne and A. C. Modahl (respectively secretary and president of the Wabash Valley Ready Mixed Concrete Association); Ralph H. Anderson (president of the Ohio R.M.C. Assn.); Glenn R. Logue (chief engineer of bridges, Ohio Dept. of Highways); R. P. Mumford (The Beckley & Wyers Co., Springfield, O.); and Stephen Stepanian (Arrow Sand & Gravel Co., Columbus, O.).

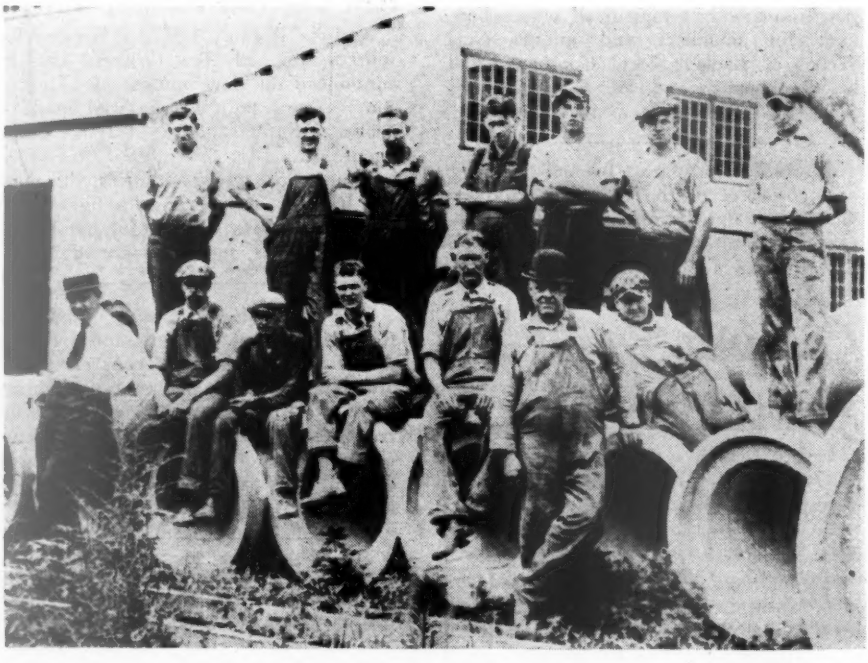
Universal Concrete Pipe Co. Reviews History of 26 Years

Universal Concrete Pipe Company has grown considerably since the accompanying photograph was taken during the fall of 1921. The 13 employees of the company lined up for a picture in the yards of the New Martinsville, W. Va., plant. The two boys on the right were part-time helpers who sprinkled pipe.

At the left in the front row—wearing the straw hat—is President H. X. Eschenbrenner. Behind him in the second row is Vice-President Harry Leuliette.

Today Universal has plants and offices in eight states and 15 cities. Plants are located as follows: Decatur and Dothan, Ala.; Atlanta, Ga.; Kenvil, N. J. Columbus and Zanesville, O.; Norristown and Pittsburgh, Pa.; Nashville, Tenn., and Clarksburgh, New Martinsville and Wheeling, W. Va.

Subsidiary companies are located in Erie, Pa.; Cleveland, Sandusky and Youngstown, O.; and Augusta, Ga.



• Seventeen years ago the staff of the Universal Concrete Pipe Co. posed for this picture outside the plant.

Oregon Ready-Mix Concern Takes Over Sand-Gravel Plant

Valley Concrete Company, Portland, has purchased the Independence Sand and Gravel Company's facilities in Independence, Ore. The sale included the gravel company's entire holdings, including equipment and approximately six acres of land.

The new owners are Robert C. and Arthur B. Woods, brothers, who have operated the concrete ready-mix plant at the gravel company's site since last July. The new firm will operate under the name of Valley Concrete Company and will deal in sand, crushed gravel, cement and ready-mix concrete. The combined operation represents an investment of well over $1,000,000. The former personnel will be retained. J. H. McKay and H. B. Ruth of Eugene and G. C. Skinner of Independence were the former owners.

Swickard Elected President of Columbus Block Makers' Group

John M. Swickard, of Swickard & Crissman, and Carl K. Dale, of Al C. Dale and Son, were named president and vice-president, respectively, by the Columbus Concrete Block Manufacturers Association, Columbus, Ohio.

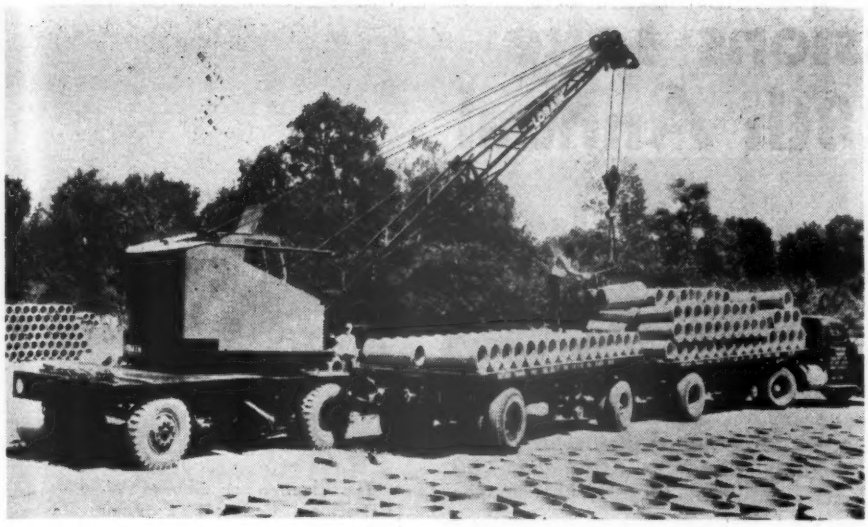
The retiring president, Robert G. Kern, Columbus Builders Supply, Inc., became a member of the executive committee with the other officers. John F. Royer continues as secretary. Offices of the Association are located at 50 E. Broad St., Columbus 15.

Government Booklet Issued On Exterior Masonry Paints

Complete data on the relative durability and performance of four general classes of masonry paints have recently been published by the National Bureau of Standards under the title of *Paints for Exterior Masonry Walls.*

The booklet, prepared by C. Sentel is now available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 15 cents per copy.

Aubrey Bowen, 55, president of the Building Block Division of Cutler Ice Co., died on February 19 after an illness of several weeks. The concrete block subsidiary, organized about one year ago, operates two plants in this city.



• Efficiency in loading concrete pipe is demonstrated in the yards of The Toledo Concrete Pipe Co., Toledo, O., where a Thew Lorain TL-20 self-propelled crane is used on a 4 x 2 carrier, for loading concrete pipe ranging in diameter from 10 inches to 84 inches from storage piles located in many different parts of the yard. The crane's mobility permits the loading of two or three different sizes in one load.

Monaghan Named Executive of Universal Concrete Pipe Co.

Thomas H. Monaghan has been appointed assistant to the president and sales manager of the Universal Concrete Pipe Company, Columbus, O.

Mr. Monaghan started with Universal in the Pittsburgh office, where he became sales manager before he was transferred to headquarters in Columbus. Prior to that, he was sales representative for the Ohio Bell Telephone Company. Universal plants in 15 cities throughout eight states manufacture concrete pipe and block and drain tile.

Curtis, Young Appointed to Lone Star Cement Sales Posts

The Lone Star Cement Corporation, Indiana Division, announces the appointment of Arthur L. Curtis as assistant sales manager of the division, effective January 1.

Another appointment was that of John Young Jr., who became district sales manager for the division, with headquarters at 1058 Builders Bldg., Chicago.

3,000,000-Ton Hill of Pumice Starts Moving Eastward

The Builders' Supply Company, Phoenix, Ariz., is not likely to run out of pumice within the next half year, for the firm recently awarded to Raleigh Barnette and Jackson Brothers of Wickenburg, Ariz., a six-month contract for about 3,000,000 tons of the material.

Under the terms of the agreement the Wickenburg concern is to remove a small mountain of pumice near Hope and ship it to Phoenix, where it will be made into a new type of lightweight block. The construction of a crushing plant has been started at Vicksburg.

Governor-Aspirant in Utah Is Concrete Products Maker

W. R. White, head of the W. R. White Co., Ogden, Utah, manufacturer of concrete and corrugated metal pipe, has announced his candidacy for the Democratic nomination for governor of Utah this year.

A former speaker of the Utah House of Representatives, Mr. White, besides being a manufacturer, operates a fruit farm in Box Elder County. He is a director of several local organizations.

Facilities of the Des Moines (Ia.) Concrete Products Company will be remodeled and enlarged to give the plant double its present capacity, according to Nate Hanford, owner. Among the new equipment will be a Kewanee boiler, Unit heaters and oil burners.

Layrite Current Production Up to 50,000 Units per Day In Its Three Plants

Layrite Concrete Products Company at Kennewick, Wash., owned by J. Friess and R. W. Ross, now has a production of approximately 15,000 concrete blocks per day. With its other plants, located in Spokane and Seattle, the firm has a total daily output of 50,000 units.

The owners report that plans are under consideration for expanding the facilities of the Kennewick plant for increased production.

Utah Farm Service Issues Sawdust Concrete Booklet

The Utah State Agricultural College Extension Service has issued a booklet of complete instructions entitled *Sawdust Concrete,* prepared by Joseph Coulam. Among the most popular uses for this material are floors for chicken coops, dairy barns or similar farm buildings. It may be used for table tops, if sand is added.

The advantages claimed are lower thermal conductivity; greater resistance to settling, vibration and impact; greater resilience; and better resistance to weather changes. The cement sawdust concrete, however, is not considered good structural material.

Williams, Albinson Promoted To New Ash Grove Positions

Two promotions were recently announced by C. A. Nulty, sales manager of the Ash Grove Lime & Portland Cement Company, Omaha.

John W. Williams, formerly sales representative, has been appointed assistant sales manager at Omaha. Lloyd D. Albinson, who was also formerly a sale representative, is now special sales representative at Omaha.

Greer, S. C., is the location of a new industry, the Greer Concrete and Block Company. Construction was scheduled to begin at once on the site recently purchased in Greer by the firm. Cost of the new plant and equipment is expected to be about $35,000.

Elmer Feltman and Russel Schaefer recently purchased the O'Fallon Concrete Products Company, formerly operated by Albert and Edwin Ahle at O'Fallon, Ill.

• A tractor with excess power and strength for the heavy job was chosen by the Koenig Coal and Supply Company of Detroit to operate the Jaeger concrete mixer of 5-cu. yd. capacity recently added to the company's ready-mix concrete division. The tractor is a heavy-duty (3-ton) Dodge WR-67 of 160-in. wheelbase, with four-rear-wheel drive. The 128-hp. engine has sodium-cooled exhaust valves; its many new features provide adequate power for traction as well as for the power take-off to operate the mixer. Together the mixer and the tractor constitute an extremely efficient working unit. The company uses space on the equipment to adverfise its fuel oil division.

Technical Sessions Take Spotlight at 28th Annual Convention of N.C.M.A.

BLOCK MAKERS ELECT GEORGE KATTERJOHN TO PRESIDENCY

• The election of George W. Katterjohn (Katterjohn Concrete Products, Paducah, Ky.) to the office of president established two "firsts" for the association. He is not only the youngest man to receive this honor, but is the first chief executive from south of the Mason and Dixon line.

another P and Q exclusive

THE National Concrete Masonry Association held its 28th annual convention at the Hotel New Yorker in New York on the first three days of March. An "off year" from the standpoint of machinery exhibits, the 1948 gathering, without the inducement of an exposition, was attended by well over 600 concrete masonry producers and equipment manufacturers from all sections of the country. Those who came from distant points were well rewarded for their trouble, for the program of the 3-day meeting was unquestionably one of the finest in the association's long history. Not only were the formal papers uniformly excellent, but the open forum sessions, in which rank and file members played an important role, were without exception the most interesting and informative meetings of their kind we have ever attended.

By WILLIAM M. AVERY

George W. Katterjohn, long one of the leading spirits in N.C.M.A., was elected president of the association for the coming year. Mr. Katterjohn, who operates block plants at Paducah and Owensboro, Ky., under the name Katterjohn Concrete Products, is the first chief executive of the organization to come from below the Mason and Dixon line. During the presidency of Henry Buchholz, whom he succeeded, Mr. Katterjohn served as one of the association's three vice-presidents. Among his important contributions to the industry was the instigation of the excellent Southeastern Region group meetings held at Birmingham in 1946, and at New Orleans last year.

The association's banquet and entertainment, held on the second evening, proved to be one of the high spots of the meeting. Almost 600 producers and their wives jammed the ballroom of the New Yorker, and the performers, delighted by the enthusiasm of their audience, ran themselves ragged with encores.

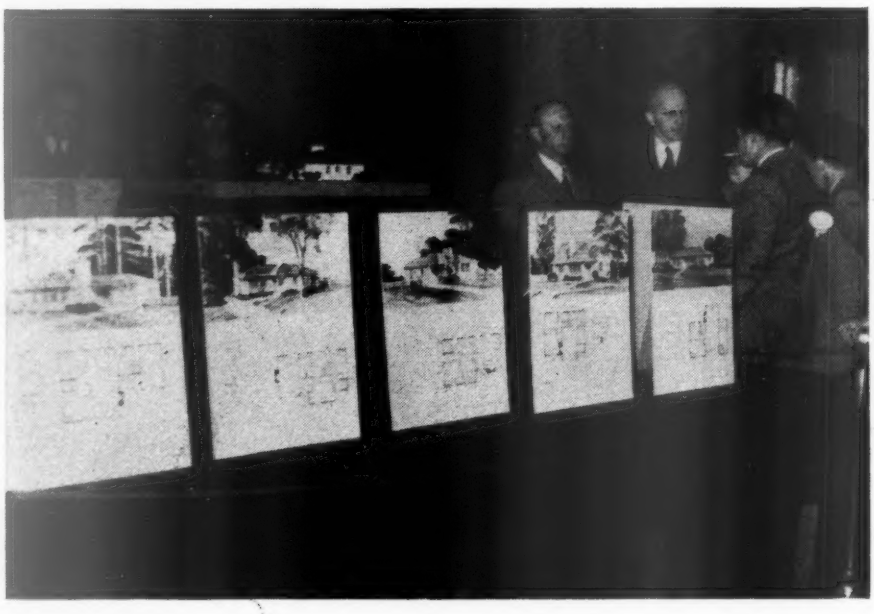
On the last day of the convention several hundred producers took special trains to Hamden, Conn., where they saw Plasticrete Corporation's fine, modern plant in operation.

Opening Session At the opening session both Mr. Buchholz and Executive Secretary Dienhart made reference to the association's excellent financial condition, and to the ever widening scope of its activities in every sphere affecting the concrete masonry industry. Mr. Dienhart made specific mention of the important part which the association is playing in the overall cooperative effort of business and industry to preserve the private enterprise system in America.

Technical Problems R. E. Copeland, director of engineering, gave a brief summary of some of the technical problems that are currently being studied, and he outlined some of the areas of investigation which will receive attention in the near future. In the latter category he mentioned that more work will be done in connection with admixtures, curing, tensile strength, elastic modulus and shrinkage cracking.

One of the industry's most critical problems at present, Mr. Copeland said, is the great increase in the cost of laying concrete block. The association's Technical Problems Committee now has this problem under advisement, and is expected to make recommendations regarding it in the near future.

The speaker mentioned the tremendous influx of requests from producers for assistance in solving a wide assortment of technical problems. This trend, he pointed out, indicates the industry's increasing interest in improving the quality of its product. Although the association's staff is still relatively small, Mr. Copeland said that such requests from member companies are welcomed, and receive prompt attention.



• Closeup of some of the concrete masonry home plans contained in the association's new portfolio. All 16 plans were displayed in the foyer of the New Yorker's ballroom.

Noble Award Deane R. Lynde, chairman of the association's board of directors, presented to Harold Mills the $500 prize for the best entry in the Thomas W. Noble award competition for 1947. Mr. Mills, who is general superintendent of the Concrete Products Corp. of South Bend, Ind., thus became the first winner of the award, established about a year ago to recognize the most outstanding achievement in the concrete products field. Mr. Mills' entry was an electrical device, applicable to all pressure-head vibrating machines, which controls the height of block within a tolerance of 1/16 of an inch.

New York Picture E. M. Fleming, district manager of the Portland Cement Association, presented an excellent paper outlining the status of concrete masonry units as a structural material in New York State. Of the 222 major plants now operating in the state, Mr. Fleming said, 63 produce fewer than 100,000 equivalents annually, 98 produce from 100,000 to 500,000, 27 from 500,000 to 1,000,000, and 34 turn out more than 1,000,000. In 1947 these plants are estimated to have-produced approximately 100,000 masonry units, or roughly 1/10 of the total output for the entire nation. The state's concrete masonry plants consumed about 1,100,000 bbls. of cement, or approximately 8.6 percent of the New York State total.

Although the 1947 production figures are impressive, Mr. Fleming believes the market is far from saturated. In support of this, he pointed out if New York had used concrete block at the same rate per capita as New Jersey, the output in 1947 would have approximated

• This excellent model of a modern concrete masonry home development was displayed by the Besser Manufacturing Co., Alpena, Mich.

• John Stoune (W. G. Traver Supply Co., Decatur, Ill.); G. M. Neff and W. A. Neff (Neff Concrete Products Co., Danville, Ill.); Carl Fox (Marquette Cement Manufacturing Co., Chicago); Cloyd Fellabaum and W. R. Fellabaum (National Cement Products Co., Toledo, O.).

• Below, left: Sam Paturzo (V. Paturzo Brothers & Son, Baltimore); Ciro Paolella (Plasticrete Corp., Hamden, Conn.); James Henry (E. P. Henry & Son, Woodbury, N. J.); and George J. Barker (Gerlach & Moranz Brick Co., Philadelphia). Mr. Barker is also secretary of the Eastern Concrete Products Assn.

• Below, right: We caught these four representatives of the Marietta Concrete Corp., Marietta, O., during one of the all-too-brief lulls between meetings. They are J. D. Ross, from the company's Baltimore plant, and R. Neil Christy, R. C. McCall and E. A. Foust, from the Marietta offices.

• Above: Gene Olsen, president of Stearns Mfg. Co., and E. B. Kelley, who is the acknowledged dean of all the concrete products machinery salesmen in the country.

• Center: Father-and-son combinations are still far from common in the block business. This one consists of Grant N. Reinhold and Fred W. Reinhold of Anchor Concrete Products, Inc., Buffalo.

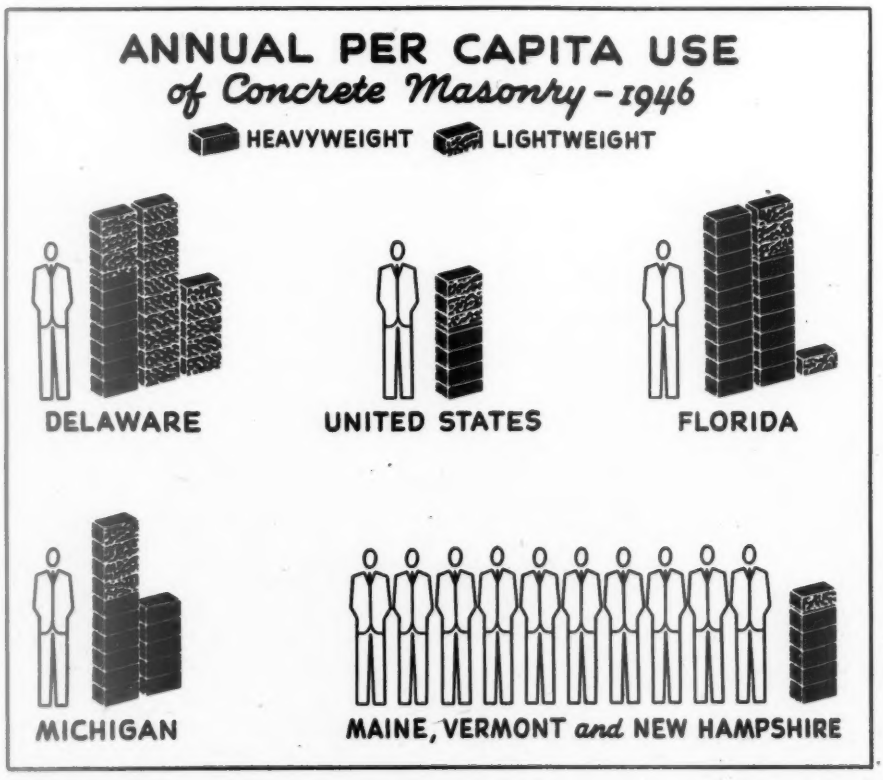
• Above: Recorded here is one of the very few moments during the entire convention when Executive-Secretary E. W. Dienhart slowed down long enough for us to take his picture. The gentleman on the left is Phillip Buehner of the Buehner Cinder Block Company, Salt Lake City.

180,000,000 units, or about 80 percent more than the actual production.

According to the speaker, in New York City only 1 percent of structures built in 1947 (not including garages and 1-story commercial buildings) employed concrete masonry in exposed walls, and the figure for the remainder of the state is only about 2 percent. In both areas from 75 to 80 percent of the garages and 1-story commercial buildings used exposed concrete masonry walls, although in a number of structures face brick or tile was used in the front walls. From 1 to 2 percent of new homes used block in this manner.

In both the city and up-state areas, Mr. Fleming said, it is estimated that about 80 percent of new structures used block for partitions and back-up. Concrete walls were used in 38,669 homes built in the state during 1947, but those with exposed and painted masonry walls totaled only about 1,500. Thus, Mr. Fleming pointed out, there cannot be much expansion in the back-up and partition market, except as occasioned by increases in construction volume. The big market for expansion, he stated, is in exposed walls (both exterior and interior) for structures of all types.

To develop this market, Mr. Fleming feels that the concrete masonry industry must effect steady improvement in the quality of its product, and adopt planned sales and promotion programs on a larger scale than ever before. For the latter purpose he suggested the formation of cooperative groups in and around cities of considerable size to carry on intensive work for the betterment of the concrete masonry market in such areas. The cooperative groups should be of sufficient size to be able to employ competent engineers who would function under the direction of N.C.M.A.



• One of the graphic charts used by Paul Woodworth to show trends in the per capita use of concrete masonry in various sections of the United States.

Future Markets In an address entitled *Where Do We Go from Here?* Paul M. Woodworth, director of research, Waylite Co., Chicago, posed a number of questions the answers to which will largely determine the future growth of the market for concrete masonry units. The industry's present volume would be doubled, Mr. Woodworth said, if concrete masonry fillers were used in the 40,000,000 sq. ft. of residential floors built each month in the United States.

Pointing out that 95 percent of the industry's output now consists of 3-core, 8- by 8- by 16-in. units, the speaker suggested that close study be given to the problem of developing a more attractive and acceptable unit. A long forward step in wider public acceptance, according to Mr. Woodworth, would be the development of low-cost acceptable interior finishes. The industry, he said, needs a resurgence of the drive and enthusiasm given to it by F. J. Straub 25 years ago.

One of the questions raised by the speaker concerned the proportion of gross income now being spent in the industry for sales, development and promotional purposes. He suggested that the amount must be very small, indeed, and that perhaps the prosperity of the past few years has produced a dangerous complacency. Markets could be expanded very materially, Mr. Woodworth said, if as little as 1 or 2 percent of gross income were allocated for that important purpose. He pointed out that the industry's gross sales in 1947 amounted to $200,000,000.

• Left: George W. Kuhlhavey (Carter-Waters Co., Kansas City) and Earl W. Peterson (Ideal Cement Stone Co., Omaha).
• Center: R. O. Robinson of the Kent Machine Co., Cuyahoga Falls, O., and Jack Duble, eastern representative of The Concrete Manufacturer, paused for a brief chat just before one of the meetings.
• Right: L. C. George and C. E. Patton of the F. C. George Machine Co., Orlando, Fla.

Mr. Woodworth used a number of graphs to illustrate his talk. One of them, reproduced here, shows the annual per capita use of heavyweight and lightweight units in 1946 for certain selected states and for the United States as a whole. The future market potential is vividly portrayed by the comparison between some of the New England states, where 6 units were used for every 10 people, with Delaware, where the rate was 25 per capita.

PANEL DISCUSSION ON AGGREGATES

Departing from the former practice of holding separate sessions for the various aggregate divisions, this year the association held one open forum session covering the entire field. The amount of interest generated and the enthusiastic response from all who were present plainly indicated that the new procedure met with general approval, and it is to be hoped that this practice will be followed in future meetings.

Horace W. Bush (Multiplex Concrete Co., East Orange, N. J.) presided over the meeting, and the following men functioned as discussion leaders for the divisions indicated: Benjamin Wilk—natural aggregates; Paul M. Woodworth—Waylite; D. G. Wheeler—Celocrete; Frank H. Holt — Superock; A. R. Waters — Haydite; C. M. Rollins — cinders; A. G. Streblow — pumice.

Natural Aggregate It was brought out that 60 percent of all the masonry units produced in 1946 were made with sand and gravel, but that an increasing number of the larger plants in the industry are changing to lightweight aggregate. There was some discussion of the effects of gradation on the strength of heavyweight units, and Mr. Wilk made several specific suggestions in this connection. He suggested the use of a combined aggregate having a fineness modulus of 3.70, with 25 percent retained on the No. 4 screen, 40 percent on the number 8, 55 percent on the No. 14, 70 percent on the No. 28, 85 percent on the No. 48 and 95 percent on the No. 100. This gradation, Mr. Wilk said, gives good results from the standpoint of strength, density and texture.

Waylite Although the output of Waylite in 1947 was 5 times greater than in any average prewar construction year, Mr. Woodworth said that the output in 1948 is already entirely covered by commitments. Over 90 percent of current shipments go to block companies, most of which have been Waylite users for the past 8 or 10 years.

For several years the Waylite Company has carried on negotiations with various steel mills in an effort to develop increased capacity. In 1949 the company expects to produce twice as much Waylite as it did in 1947.

Questions from the floor brought out the following information about Waylite: It is sold only on a volume basis, the price being $1.65 per cu. yd. (loose measure) f.o.b. plant. In an average mix for making block it weighs 1,350 lbs. per cu. yd., producing an 8-in. unit that weighs 28 to 31 lbs. Waylite yields 52 to 55 blocks per cu. yd., and 700 p.s.i. requirements can be met with a yield of better than 20 units per sack of cement. Eight-inch Waylite blocks have an insulating value of 0.33, or about the same as an 8-in. brick wall furred and plastered.

Celocrete Mr. Wheeler pointed out the many difficulties and great expense involved in developing plant facilities for producing Celocrete. He said that his company is making every possible effort to increase capacity in the

• Below, left: C. S. DeLamater (Stearns Mfg. Co., Adrian, Mich.); G. M. Friel (Anchor Concrete Machinery Co., Columbus, O.); and A. E. Chronister (A. E. Chronister Block Co., Hanover, Pa.).
• Below, right: Charles A. Toone and H. A. Williams (both of the Cherrydale Cement Block Co., Inc., Arlington, Va.); Orville Hartley and Charles Fulmer (both of the Messinger Supply Co., Easton, Pa.).

areas of high demand, but that the process is inevitably slow. Of the 249 blast furnaces now operating in the United States, 93 percent are located east of the Mississippi River, and far from all of them are adaptable to the process. Beginning April 1st, Mr. Wheeler said, the output of Celocrete at Buffalo will be doubled. Some increased capacity is also in prospect at Birmingham and Chicago. At present the company's shipments lag behind orders to the extent of about 150 cars per month.

Celocrete, the speaker said, sells for $1.85 per cu. yd. (loose weight) f.o.b., plant. The weight ranges from 1,000 to 1,150 lbs. per cu. yd. on coarse, and averages 1,500 lbs. on fine. The moisture content runs around 2 or 3 percent at the time of shipment.

Haydite Haydite production, according to Mr. Waters of the Carter-Waters Co., has been increased very materially in the past year. New plants are operating at Dallas, Texas, and Richmond, Va., and his own firm is just completing at Kansas City a 2-kiln plant which will have an annual capacity of 100,000 cu. yds. Up to the moment, he said, the production of the new Carter-Waters plant has not been completely sold.

At Mr. Waters' plant Haydite (in a mixture of 60 percent fine and 40 percent coarse) sells for $4.00 per cu. yd. f.o.b. The fine aggregate weighs from 1,350 to 1,500 lbs. per cu. yd., and the coarse from 1,050 to 1,150 lbs. per cu. yd. A standard Haydite unit with 45 percent voids weighs 22 to 26 lbs., and tests 1,000 p.s.i. or better at 28 days. The material yields about 54 units per cu. yd.

Pumice According to Mr. Streblow, pumiceous materials, including volcanic cinders and scoria, are similar to expanded slag in respect to both weight and strength. In other respects they differ quite materially from manufactured products. Crushing, screening and in some cases even washing, are necessary in connection with certain deposits, although occasionally deposits are found with an almost perfect natural gradation.

Natural pumice, Mr. Streblow said, can be beneficiated by processing, particularly by means of hammermill reduction to produce cubical particles. The material is so plentiful throughout the West that there seems no likelihood of a shortage ever developing in respect to lightweight aggregate.

Coarse pumice from Mr. Streblow's plant at Albuquerque, N. M., weighs 800 lbs. per cu. yd.; the fine material about 1,205 lbs. per cu. yd. The material yields about 55 units per cu. yd., and blocks testing 1,000 p.s.i. weigh about 30 pounds. Depending on the quantity ordered, the price ranges from $2.07 to $2.40 per cu. yd. f.o.b., Albuquerque. Delivered prices in Chicago and Detroit were quoted at $5.40 and $6.60 respectively.

Superock Every effort is being made to increase production of Superock, Mr. Holt said, but the outlook is still not too bright. Within the coming year the company hopes to effect some increase in output.

According to Mr. Holt, Superock varies in weight from 1,100 to 1,400 lbs. per cu. yd., depending on the type of slag, temperature and other factors. It is sold in only one gradation, ready for use in the manufacture of blocks. The price is $2.35 per ton f.o.b., Birmingham.

Cinders Mr. Rollins pointed out that as a result of the trend toward the use of pulverized coal and oil, cinders are no longer plentiful. His company (Plasticrete Corp.) conducted a thorough survey of the present and future supply and found a far-from-encouraging picture. Costs in the past 2 or 3 years have also gone up from 250 to 300 percent, so that the material is no longer either plentiful or cheap. To protect its supply both qualitatively and quantitatively, the Plasticrete Corp. has developed a large storage area close to its plant, with facilities for rapid unloading of cars to reduce dependency on trucks.

This, he stated, is only a stop-gap measure, and the company is meanwhile carrying on intensive research for an acceptable substitute lightweight aggregate.

Questioned about the processing of cinders, Mr. Rollins said that it is desirable to use magnetic pulleys both at the receiving point and after crushing. The first pulley usually takes out only tramp iron, while the second removes cinders with magnetic characteristics. Both anthracite and bituminous cinders are subject to staining, according to Mr. Rollins. To eliminate trouble from this source his company will subject all cinders to a lime treatment at the processing plant.

TECHNICAL SESSIONS

Indicative of the growing importance which the industry assigns to the problem of materials handling, most of one session was devoted to reports from various producers on methods worked out in their plants.

Overhead Conveyor Harold Pratt (Barnes & Cone, Inc., Syracuse) described a unique system which his company has developed for handling cubes with an overhead crane. A conventional overhead crane, with a 3-directional drive motor, enables the company to handle and load large cubes with a saving of about 33 percent in loading time as compared with conventional methods. The crane has a 40-ft. span, and the cubes are engaged and picked up by a special fork equipped with 10 tines measuring 56 in. in length.

The overhead crane method of handling, Mr. Pratt said, applied only from the cubing room of the plant on. Conventional lift trucks are used for handling the units to and from the curing kilns. He showed comparative costs figures which indicate that a bridge crane is considerably more economical to operate than either a gasoline- or electric-powered lift truck, although the initial cost is 2 or 3 times greater.

Block Unloader With a considerable number of witty asides that threatened at times to stop the show, John P. Sheehan (The Atlas Lime Co., El Paso) described the mechanical unloader which his company has developed (in cooperation with the Allison Steel Mfg. Co., Phoenix) for unloading cubes of blocks from one of its semi-trailer trucks. The equipment is designed to handle cubes consisting of seventy-five 8- by 8- by 16-in. blocks. Cubes are placed on the bed of the trailer with a high lift fork truck in the conventional manner. At the job the cubes are picked up, one at a time, by a bridle suspended from an overhead I-beam monorail. The actual lifting is done with a Budgit chain hoist attached to the trolley.

The monorails (one on each side of the trailer) are cantilevered about 4 ft. beyond the end of the trailer so that the cubes may be lowered to the ground. If desired, the cubes may be stacked 2-high. With two men (one to each bridle), 10 cubes, or 7,500 units, can be unloaded in 15 to 20 minutes. The equipment is especially effective in reducing delivery costs on short or medium-length hauls, where the ratio of manual unloading time to travel time is relatively high. The device can be fabricated and mounted at a cost of about $680.

Pallet Conveyor Harvey Black (Domine Builders Supply Co., Rochester) provided the commentary for moving pictures showing the operation of a return pallet conveyor developed and installed by his company. With this system the racks are brought from the curing room to a point adjacent to the block machine for unloading and cubing. As the pallets are cleared the off-bearer operator alternates between loading freshly molded units and placing the empty pallets onto a chain conveyor at the side of the block machine. From that point on the pallets are conveyed automatically until they drop into the magazine at the back of the machine.

One of the important advantages claimed for this device is that it eliminates one man (the pallet feeder) in the operation of high-production, plain-pallet machines. Other advantages include the saving of plant space, a sharp reduction (as much as 50 percent) in lift truck operations, and the elimination of excessive handling of racks.

Hard-Facing *Maintenance Practice With Hard-Facing Welding and Chromium Plating* was the title of a paper written by Jay C. Ehle (Cleveland Builders Supply Co.). As a result of Mr. Ehle's absence due to the sudden death of his father, his paper was read to the convention by Richard Hannon of Coast Metals, Inc. Because of the unusual nature of the subject matter and its very direct application to all plants, regardless of their size, no attempt will be made at condensation; instead, the paper will be published in its entirety in our May issue.

Shrinkage Cracking Probably no one in the country is better qualified to speak on the subject of shrinkage cracking than R. E. Copeland, the association's capable director of engineering. In a broad, definitive analysis of the entire problem, Mr. Copeland brought into sharp focus the many exceedingly complex factors which are involved. Acting separately or in various combinations, he said, there are four principal causes for the cracking of concrete masonry walls. He listed them as follows:

1) Unequal settlement or distortion of the footings or structure supporting the masonry.

2) Overstressing of the masonry caused by external forces of unusual severity which may occasionally develop from earth pressure, earthquakes, high winds, *et cetera.*

3) Abnormal distortion, especially expansion, of appurtenant elements such as floors and roofs.

4) Volume changes in the masonry involving principally temperature shrinkage and moisture shrinkage.

Mr. Copeland pointed out that there is a dearth of factual information on the relative importance of these factors in causing cracks in masonry walls. The majority of cracks, including those classed as typical shrinkage cracks, probably result from stresses caused partially by shrinkage and partially by other factors. Among the factors which may directly affect the moisture volume change of concrete, the speaker said, are the composition of the materials, the mix proportions and the method of curing.

Differences in the chemical composition of commercial portland cements, according to Mr. Copeland, may account for substantial differences in moisture volume change, in extreme cases amounting to 25 percent or more. Physical properties, especially hardness or rigidity, of the aggregate may introduce variations as great as 100 percent. Mix proportions seem to have a less important effect, and the variations from this source probably do not exceed 10 percent.

In regard to the effect of various methods of curing, Mr. Copeland stated that moisture volume change is influenced only slightly by the duration of moist curing at normal temperatures, but is more materially affected by differences in curing methods at elevated temperatures. Reductions of from 10 to 60 percent are brought about with high-pressure steam curing at about 350 degrees F. as compared with ordinary moist curing at 70 degrees, or steam curing at 130 degrees.

In itself high temperature steam curing at 170 to 200 degrees F. is not particularly effective in reducing moisture volume change. Its advantage, the speaker pointed out, comes about because the method readily lends itself to artificial drying of the block following the steam curing period. Tests indicate that thorough air drying at 230 degrees reduces moisture volume change from 30 to 55 percent.

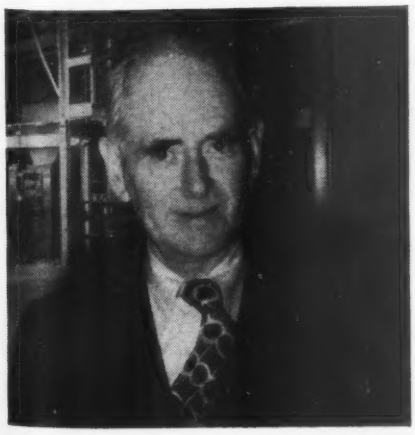
Conceding the importance of proper curing in connection with the problem of shrinkage, Mr. Copeland went on to say that there is no known method of curing that will entirely eliminate the tendency of concrete to expand with wetting and shrink with drying. Furthermore, he added, type of curing has little or no effect on temperature volume changes.

Mr. Copeland indicated that there is need for more information concerning the tensile strength of concrete block and the property of extensibility, since these properties largely determine the ability of the concrete to resist shrinkage stresses without cracking. Another factor mentioned was the design of the block itself, and in this connection the speaker strongly recommended that no further reductions be made in face shell thickness.

In closing Mr. Copeland re-

(*Continued on page* 138)

• C. A. Sirrine (Loree and Sirrine, Architects, Ann Arbor, Mich.), who spoke at one of the meetings, and E. E. Osborn (Clinton Construction Co., Wilmington, O.).



• Left: An international flavor was lent to the meeting by the presence of Frank J. Malloy, director of the Foamed Slag Products Assn., London, England.
• Right: Frank Munezer of Multiplex Concrete Machinery Company, Elmore, O.

A WORKABLE SYSTEM OF BLOCK CUBE HANDLING

another P and Q exclusive

THE bulk handling of concrete blocks by the cubing method has grown rapidly in block plants within the last five years. We, at the Geist Coal & Supply Co., looked enviously at these plants which were cubing blocks at apparent consider-

By HAROLD E. GEIST
General Manager
Geist Coal & Supply Co.
Cleveland, Ohio

able savings in time, labor and money. We could cube blocks and use lift trucks but we couldn't save any money doing it. We had evolved and practised cubing as early as 1940, but subsequently-discovered shortcomings caused us to discontinue its use.

There were a number of disadvantages. With the rigid type of fork it was necessary for the tines to enter the core holes of the blocks. This was practicable only on 8- by 8- by 16-in. blocks. On other sizes and many fractionals it was practicable only if pallets were used—an obviously unsatisfactory method. We considered following the lead of others in the industry by using a pallet base composed of standard 8-in. size blocks, or culls, on which the other sizes or specials could be cubed. The standard blocks could then either be returned on the truck, or included as part of the delivered load. For several reasons this seemed unsatisfactory in our operation and we did very little experimenting in working out a superior technique.

• A two-man team at the Geist plant forms a cube from racks spotted on either side of the cubing area. Note templates used to space the stringers.

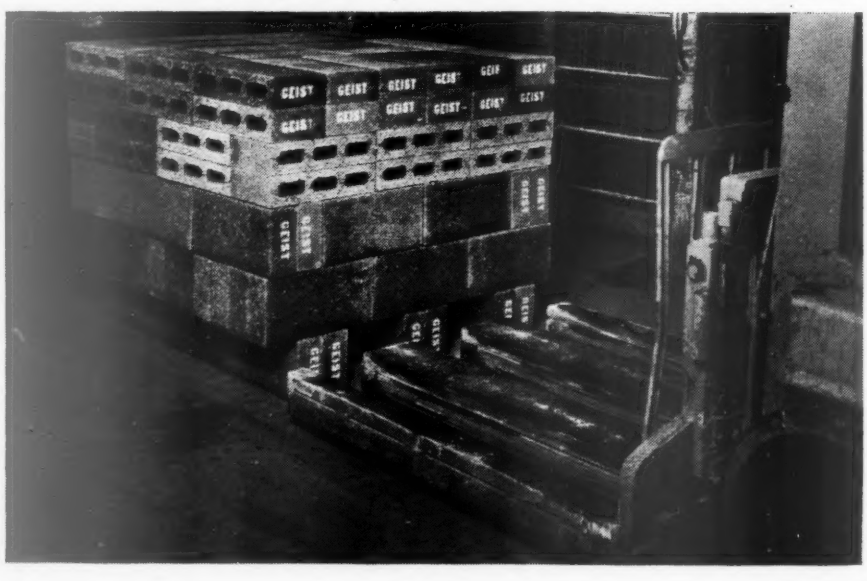
Chipping and breakage was another difficulty. The cubing operation itself demands that blocks be cubed immediately after they are removed from the kiln—a time at which they are highly subject to breakage. Accuracy is required to pick up block cubes with any kind of fork. Any sidesway, bucking, or lack of perfect alignment of the lift truck during the times the operator is picking up or setting down a cube increases the difficulties. The block forks had to be in perfect alignment with the block core holes. Therefore we felt it absolutely necessary that our yard be completely paved before we could handle cubing properly. Pneumatic-tired trucks did not work well for us since the give of the tires caused sidesway. We had a network of 8-ft. runways in our yard but it was not until early 1947 that we accomplished the paving of the complete area.

By the spring of 1947, then, we were prepared to do something about our own block-handling problem and were physically able to carry it out. At about this time The Service Caster and Truck Co. approached us with a design for a new pneumatic fork for use on their "MotoLift." We were only too glad to cooperate in helping to develop it.

Two features of the fork appealed to us particularly: (1) that the gripping surface was of rubber, inflated by compressed air, thus reducing the possibility of breakage; (2.) that the rubber tubes on the inside faces of the fork had no mechanical parts to go wrong. In other words, no pieces of foreign material could lodge in them to cause stoppage of the work.

The tests under actual operating conditions started in June, 1947, and since then the early mechanical problems of the pneumatic fork have been reduced.

Originally we started with a 5-



• Close-up of the 4-tined fork engaging a cube. Rubber gripping surfaces on the sides of the tubes are inflated with air to grip stringer blocks firmly.

tined fork, with four rows of two blocks out from the face of the carriage, giving us a 15-in. load center on the 4000-lb. fork truck. The resultant cube was too wide and short for us. Its awkward shape entailed difficulty in handling as well as in loading.

Next, we went to a 4-tined fork, the present model, with three blocks out from the face of the carriage. The 4000-lb. fork truck using this attachment had a 40-in. wheelbase, which we wanted to retain for reasons of easy maneuverability and short turning radius. With three blocks out, we added to the counterweight of the truck, giving us a 24-in. load center on the unit of the same capacity. The resultant load also gave us the better cube we needed, with 81 blocks (8- by 8- by 16-in.) in a cube or double that number of 4- by 8- by 16-in.

The inflation period of the fork tubes was originally from 10 to 20 seconds, which we found slowed the operation. We now have a reserve air tank to give almost instantaneous controlled pressure to the fork tubes. The tube has also been made to be reversible end to end and has two wearing faces for maximum holding surface and wearing quality. Like other fork lift trucks this has a side shifter, enabling the truck operator to spot a cube tight against the others without jockeying.

We contemplate the addition of recessed lights at the tip of each of the fingers, in addition to the spotlights mounted on either side of the mast. The lights at the finger ends, recessed to prevent their damage, will serve to illuminate the tube at the moment when tines are engaging the cube. The other lights are for use in kilns and for night operation.

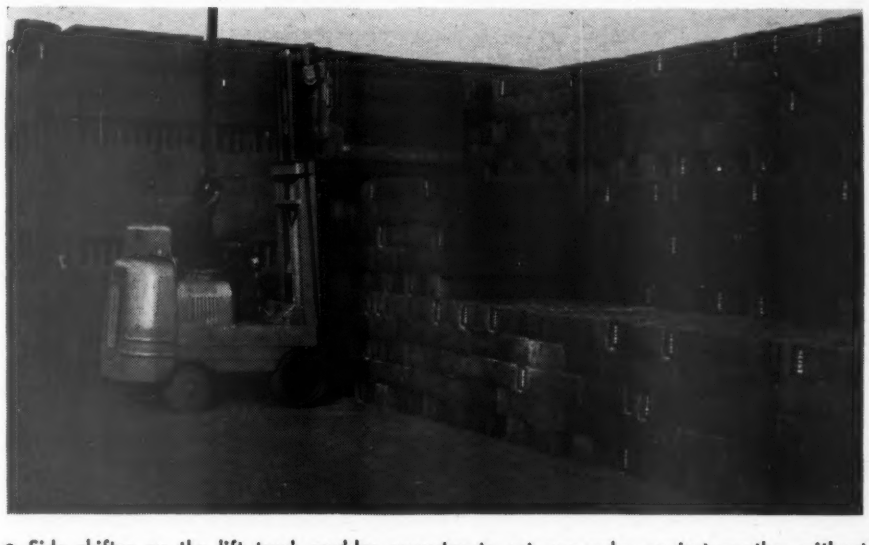
The cubing area is within the building adjacent to the curing rooms for minimum truck travel. In fine weather the cubing is done outdoors. The spacer or template on which the cube is built is made of 1- by 8¼-in. lumber, 58 inches long, the two boards connected at one end with a 2- by 8-in. crosspiece which is 42 inches long. After the three rows of stringer blocks have been placed in position, the courses on top are laid down in interlocking pattern for maximum stability of the cube during subsequent stacking and loading.

We had to develop specific production methods in order to obtain maximum machine-hour production. Here is the method worked out for cubing. Two templates are used in the cubing area by a 2-man team. A rack of cured blocks is placed within reach of each worker, and the two men work on a cube between them. In reaching for the next block as well as in cubing it, the work station motions merely requires that the men shift their weight from one foot to the other, without taking any steps. When one cube has been built, the next one is immediately started around the second template. Meanwhile, the fork truck picks off the completed cube and stacks it in the stockpile. Although this method appears satisfactory at this time and fits into our production cycle, it is subject to infinite variations and improvements.

It took us several weeks to develop the proper cubing patterns for the different sizes of blocks. While the 8½-in. spacing between the fork tines was designed to accommodate the standard 8-in. block, the fork works just as well when the stringers or finger blocks are two of 4-in. size, laid side to side or of other size blocks when laid in the proper pattern. From 90 to 95 percent of our present output is subject to cubing.

To aid speedy cube handling in the yard we worked out a table for counting. Suppose a customer's truck pulls in with an order for 650 four-in. blocks. It would be time-consuming if the fork truck operator had to figures out how many cubes it would require to make up the number wanted. Hence we developed a table showing the number of various sizes of blocks in one cube. The table can be carried out to show the amount of blocks in any number of cubes deemed necessary.

The operation of the pneumatic fork requires but little relearning on the part of the operator used to handling a fork lift-truck. Proper operation requires that the penumatic fingers carry only the stringer blocks, with the fork proper sup-



• Side shifter on the lift truck enables operator to set one cube against another without jockeying for position.

• End loading of dump trucks is accomplished by shoving cubes forward with the lift truck.

porting the main part of the cube. This is accomplished by raising the cube slightly with the forks before expanding the pneumatic fingers. In

• View showing how pneumatic tubes carry only the stringer blocks, with the main part of the cube supported by the fork proper.

setting down a cube the opposite is done—the pneumatic fingers are released an instant before the load is about to come to rest. This procedure avoids excess pressure and consequent friction on the tubing and correspondingly reduces wear. The compressed air control is on the steering column, and proper timing becomes second nature with the operator after a little practice.

In end loading of dump trucks, where one cube is loaded behind the others longitudinally to the truck, the following method is used. The fork truck operator spots the first cube at the rear of the delivery vehicle. He then brings the second cube and butts it against the first one, which is then pushed to the front of the delivery vehicle by advancing the fork truck, and the second cube is spotted behind the first one. Another cube may be set on the truck end gate which the truck driver will use to fill the open spaces on his truck.

As the handicaps were eliminated one by one we finally reached a stage where we felt we had practical operating forks, and we now have two units in operation. Breakage has been virtually eliminated. A skilled operator can load a dump truck with four cubes in five minutes. The delivery truck driver usually resets a few blocks to fill corners, with no additional loading help necessary. A large trailer is loaded with 12 or 14 cubes in 20 to 25 minutes. The penumatic fork handling operation keeps the larger part of our operation under roof, requiring the fork truck operator as the only man outside. As previously explained, valuable machine-hours and man-hours are saved because counting has been simplified by the use of cube loading and the chart. Experimenting with necessary changes in equipment and development of techniques took about 6 months.

How do the cubes ride on the stringers or finger blocks when being delivered to the job? This question is important to any block manufacturer, and it was a big point with us because The Geist Coal & Supply Co. trucks deliver to jobs located up to 200 miles from Cleveland. After we had put the method into effect, we decided that the best way would be to follow a truck on a long haul and see for ourselves. The trailer had 14 cubes on it. Several of us followed in a car, watching the load closely on grades and turns. After we had followed the load for 40 miles, we were satisfied that the riding characteristic of the cubes was all we had expected.

Some years ago at the Buffalo N.C.M.A. convention, and again at one or more of the Chicago conventions Herbert Geist presented the cubing idea to the assembled block makers. Since that time many manufacturers have taken it up, and at this moment there are block men all over the country using the method to good advantage.

Effect of Dispersed Carbon Black On Air Entrainment in Concrete

By FRANK J. MARDULIER
Cement Division
Dewey & Almy Chemical Company

FINELY divided dispersed carbon black emulsions have been used for a good many years as an additive to concrete in order to color that concrete and distinguish it from other plain concrete, such as in the case of center stripings, passing lanes, etc. The advent of air entrainment created a problem in the use of such finely divided carbon black dispersions because it was early discovered that the normal percentages of entrained air were not obtained in carbon black concrete upon the addition of normal percentages of the air-entraining agent. For example, it was found that the percentage of the air-entraining agent which would normally entrain 5 percent air in regular concrete, would entrain only 2 percent air or less in the concrete containing finely divided carbon black dispersions.

In studying this tendency of carbon black to inhibit the formation of entrained air, it occurred to our research chemists that the selective absorption of the air-entraining agent by carbon black was very largely dependent upon the particle size of the carbon black. In fact, subsequent tests showed that above a certain minimum size, such selective absorption was minimized to the point where its effect on air entrainment was not of any consequence. Hence, new carbon black dispersions have been prepared for use in concrete which give the desired black color without effecting air entrainment. Tests on such a carbon black dispersion are tabulated below.

It will be noted that the carbon black dispersion, labeled "B" in the table below did not increase the density of non air-entrained concrete containing it. Furthermore, the addition of a normal percentage of Darex AEA, currently permitted by A.S.T.M. as an air-entraining agent, increased the air content 5½ percent as would have been expected in a plain concrete containing no carbon black. Workability of the carbon black concrete containing the air-entraining agent was greatly increased, with the result that a substantial water cut was made possible. This water cut resulted in concrete compressive strengths considerably in excess of the strengths obtained on plain concrete without carbon black, with or without any entrained air.

Current findings show that the new carbon black dispersions, while giving a satisfactory color value, will have no effect on the action of air-entraining agents normally employed in concrete today.

Effect of Carbon Black on Air Entrainment

Emulsified Carbon Black Type	Percent	AEA Percent	Unit Weight Lbs./Cu. Ft.	Percent Added Air	Slump Inches	Comoressive Strength—P.S.I.		
						1 Day	3 Days	28 Days
.....	0	0.0	148.0	.....	4.5	400	1220	4070
.....	0	0.3	140.5	5.8	7.0	370	990	3950
B	2	0.0	148.0	0.0	4.0	380	1100	4160
B	2	0.3	140.0	5.4	4.5	435	1350	4550

American Concrete Institute Holds Successful Convention at Denver

THE annual convention of the American Concrete Institute held at the Shirley-Savoy Hotel, Denver, Colo., on February 23 through 25 was highly successful. The registration was the largest of record—approximately 875. For the first time in the institute's 44-year history, an exhibit of equipment and special materials was conducted throughout the meeting. The exhibits added materially to the interest of the convention. In addition, the host-committee had arranged for a buffet lunch and inspection at the new laboratory of the Bureau of Reclamation, and an all-day trip to the construction site of the Colorado-Big Thompson diversion project in the vicinity of Estes Park.

The opening session was devoted chiefly to a discussion of concrete-house construction. C. A. Clark of the Portland Cement Assn., Austin, Tex., presented a sound film showing the application of "tilt-up" construction to a large-scale housing project; the economical use of both labor and material was emphasized. Capt. H. L. Mathews (CEC) USN described with illustrations the construction of 490 four-room houses at the Naval Ordnance Test Station at Inyokern, Calif. These houses, built of prefabricated units of light-weight concrete with pumice aggregate, were especially suited for the Mojave Desert conditions because of the good insulation. Although the present houses of 750 sq. ft., equipped with electric stove and refrigerator, cost approximately $7,240, Captain Mathews predicted that the cost per unit for a further project would be considerably lower.

The fabrication of "Flexicore" floor planks, using prestressed steel reinforcing, was illustrated by G. B. Price, Price Bros. Co., Dayton, O. A paper by Arthur Stone, Portland Cement Assn., Chicago, discussing thermal insulation of concrete houses, was abstracted by Carl A. Menzel, also of the P.C.A. The paper demonstrated that by the use of appropriate insulation the heat loss with any type of wall can be reduced to approximately the same value. The use of standardized precast reinforced concrete structural shapes in one- and two-story industrial buildings was outlined with motion pictures by C. A. Grafflin, Cemenstone Corp., Pittsburgh. It was pointed out that such precast units are now being shipped 200 to 300 miles for erection.

The second technical session was devoted to a discussion of the resistance of concrete to various destructive agencies. A paper by H. S. Sweet and K. B. Woods of Purdue University reviewed the experience of the Indiana Highway Dept. with various aggregates, which had led to the conclusion that when sound aggregates are used in highways, transverse expansion joints are seldom required. Thos. E. Stanton of the California Division of Highways reported an extensive series of accelerated tests with concrete exposed to sea water which indicated that serious deterioration will not occur if (1) the cement and aggregates are sound, (2) the cement aggregate combination is non-reactive, (3) the concrete is impervious, and (4) there is no segregation or honeycomb. He reported that air entrainment and the addition of puzzolan up to 20 percent of the cement content both improved the resistance to deterioration from sulphate soil and sea water.

Robert F. Blanks
Newly-elected president of A.C.I.

An exceptionally interesting description of the steps taken to determine the cause of unusually great expansion in the concrete of a shipway was presented by Ruth D. Terzaghi. The investigation concluded that the expansion was due to the reaction of excessive CO_2 gas rising from the subsoil, with the calcium hydroxide in the concrete. Incidentally, Mrs. Terzaghi was the first woman to appear on an A.C.I. program for many years. The session closed with a report by W. E. Gibson, Kansas State Highway Dept., of a study conducted by Prof. C. H. Scholer and himself of concrete exposed to various types of exposure. It was found that durability to extreme exposure was improved by blending limestone with several gravels which had mediocre service records.

About 600 attended the luncheon arranged by the local committee at the Bureau of Reclamation's new laboratories at the Denver Federal Center, whose buildings housed a large small-arms-plant during the late war. The *piece de resistance* at the buffet lunch was barbecued buffalo, which was both tender and tasty; many compared it with lamb. After lunch, the extensive laboratories of the Bureau were open for inspection. On the floor of the main building were a number of hydraulic models under test, including dams, spillways, settling basins and other structures. Among the new testing equipment was a three-dimension compression machine. Surrounding the main test floor and on balconies were various shops and specialized laboratories, including petrographic, photographic, chemical, electronic, and others. The inspection was an impressive demonstration of the detailed attention which the design and erection of some of the nation's greatest concrete structures are receiving.

At the annual convention dinner held at the Shirley-Savoy hotel the same evening, Stanton Walker, retiring president, outlined the current activities of the institute. He then presented the institute's awards to the following:

Carl A. Menzel, who received the L. C. Wason medal for the "most meritorious paper" in the last volume of *A.C.I. Proceedings;* T. C. Powers and T. L. Brownyard, who received the L. C. Wason medal for

"noteworthy" research; R. J. Willson, who received the A.C.I. construction practice award.

The new officers, installed during the dinner, were Robert F. Blanks, president; Hubert J. Gilkey, vice-president for one year; Frank H. Jackson, vice-president for two years. Directors included: P. W. Norton, W. H. Klein and R. E. Copeland for one year; A. J. Boase, A. T. Goldbeck and G. W. Washa for two years; H. P. Bigler, C. H. Scholer, M. A. Swaze and R. B. Young for three years.

Mr. Blanks is Chief, Engineering and Geological Control and Research Division, of the U. S. Bureau of Reclamation. His office is at Denver.

The guest speaker at the dinner was Bradley Dewey, Cambridge, Mass., who was a member of the President's committee to evaluate the Bikini atom bomb tests. He stated that as the report of the committee filed recently had not been released, he was able to make only personal comments regarding the significance of the atom bomb. His remarks, given during the showing of official Navy movies of the Bikini tests, gave a disturbing view of the great destructive power of the atom bomb. He advocated prompt congressional action to authorize the President or a delegated official commission, to initiate an atomic counter-attack against any nation known to be preparing a similar attack against America, without the delay which might be occasioned by awaiting a declaration of war by the Congress. Mr. Dewey advocated three long-range steps in U. S. policy: (1) adequate armament with the bomb, as a step in preparedness but not as a means of imposing U. S. will; (2) constant congressional inquiry to insure continued cooperation between the Atomic Energy Commission and the military; and (3) an air-arm strong enough to deliver atomic bombs against any aggressor nation.

A wide scope of investigations was reported at the open session of the Research Committee, held the following (Wednesday) morning. Further observations on durability were reported, including the effect of cement fineness, air content and the influence of thermal properties of aggregates. Among other researches reported were a method of measuring bleeding, resistance of floors to corrosion by various solutions, long-time tests of concrete with Types I, II, and III cements, and preliminary reports on bar tests by the American Iron and Steel Institute comparing plain hooked bars with old- and new-type deformed bars.

The question of bond stress was discussed further in a committee report presented at the afternoon session by Hubert J. Gilky. The report included the suggestion that the new deformed bars offer promise of justifying greater bond resistance than is usually considered in designing.

Observations regarding concrete pavements on the German "autobahnen", based on personal inspection during the summer of 1947, were reported by F. H. Jackson and Harold Allen, of the U. S. Bureau of Public Roads. They concluded that the good condition of these roads was due largely to the mild climate and the relatively small amount of heavy-load traffic, as the cement was inferior to typical U. S. cements. They recommended the initiation of research on: (1) obtaining greater uniformity of concrete, possibly by reducing the maximum size of aggregate; (2) use of mechanical compaction; and (3) intensive study of the characteristics of cement as they affect the performance of concrete in roads.

A report on laboratory measurements by strain gauges of stresses in the steel of reinforced 8-in. by 8-in. by 48-in. beams was presented by Douglas McHenry, U. S. Bureau of Reclamation, as offering a new method for laboratory tests on model structures. The session closed with an illustrated description by Prof. R. E. Davis of the recent restoration of Barker Dam owned by the Public Service Co. of Colorado, in which the pre-packed method was employed during winter months to install a new upstream face on the dam. This work also increased greatly the stability of the structure.

Stanton Walker
Retiring president of A.C.I.

The closing technical session was devoted to a discussion of the progress accomplished with concrete during the last 25 years. The topic was a throw-back to an editorial in a leading technical publication in 1923 which raised some doubts as to the then current knowledge of concrete. The discussion was introduced by W. G. Bowman, *Engineering News Record,* New York, who suggested that significant progress has been made on the major problems of attack by sea water, adequate inspection, reliance on opinion instead of positive information, and control in manufacture; but he considered that perfection has not yet been attained. A larger number of points of advance during 25 years in the knowledge of concrete, and also many needs for further knowledge, were outlined in a symposium to which a number of past presidents of the institute contributed, including P. H. Bates, R. W. Crum, J. C. Pearson, F. E. Richart, and R. B. Young.

On Thursday a party of about 200 took an all-day inspection trip to the extensive construction by the Bureau of Reclamation in the vicinity of Estes Park, Colo. These works, including tunnels, large conduits, dams and power-houses, will handle the east-slope flow from the Alba B. Adams 13-mile tunnel under the Continental Divide, through which water from the Colorado River will be diverted into the Big Thompson River in the Missouri River drainage, to serve an irrigation project in northern Colorado. As the day was unusually clear, it was possible to view the Divide from Long's Peak on the north to Pike's Peak on the south, a distance of over 125 miles. The trip was both instructive and enjoyable.

This convention, the first held by the A.C.I. west of the Mississippi River, will be memorable, not only for the large attendance, but also for the great interest in the technical sessions and the many accessory features including the exhibit of equipment, the inspection of the Bureau laboratories and the trip to the Colorado-Big Thompson project. A Denver local committee, headed by E. W. Thorson, had made very adequate advance arrangements. The 1949 convention will be held in New York City.

Producers at Wabash Valley Meeting Urged To Keep up Good Work

Operators asked to campaign against outmoded building codes and have A.C.I. codes incorporated in local building regulations.

• C. "Dolly" Gray, president of the National Ready Mixed Concrete Assn., enjoys a hearty chuckle with Pat O'Leary, president-elect of the Wabash Valley Assn.

another ON THE SPOT report

THE 6th annual convention and short course of the Wabash Valley Ready Mixed Concrete Association was held in Chicago's Stevens Hotel, March 4-5, with more than 150 producers and guests in attendance. Keynote of the group's sixth annual meeting was sounded by C. "Dolly" Gray, president of the national association (and the first president of the Wabash Valley group), who praised the work of local organizations. These (local) groups, said Mr. Gray, are not only the necessary supplements of a strong, flourishing national association, but they foster and encourage high standards for ready-mixed concrete in their localities.

By EDWARD BRUNENKANT

No Price Controls

Every one of the more than 4000 bills now before Congress, said Vincent P. Ahearn, executive secretary of the National Sand & Gravel and National Ready Mixed Concrete Assns., directly or indirectly affect our industry. So far, he said, industry has fared pretty well at the hands of Congress. The 80th Congress passed two bills—the Portal-to-Portal and the Taft-Hartley—both of which were very beneficial to industry. However, Mr. Ahearn emphasized, industry did very little to help promote the passage of the long overdue Taft-Hartley Law. The unions, he believes, wrote this bill through their indiscriminate use of the boycott, their excessive dues, and their muzzling of individual rights.

Business must keep an open mind, Mr. Ahearn warned, and allow re-examination and changing of the weak or unworkable clauses in the Taft-Hartley Law. This law will not be revoked this year, he said, but in the event of crippling major strikes, Congress will be compelled to take drastic action. Drastic action means compulsory arbitration —a short-cut to complete socialization.

Steel's poorly-advised $5 per ton price boost has provided additional ammunition for those groups who are plugging for government allocation and price controls. Fortunately, said Vincent Ahearn, there will be no price controls this year despite the inexcusable bad timing on the part of the steel industry. However, he persisted, if aggravated shortages continue, controls are just around the corner.

New Officers

Charles P. O'Leary, Terre Haute, Ind., was elected president of the Wabash Valley association. He succeeds Adolph C. Modahl. Walter Atchison moved up to the vice-president's post. Elected to the board of directors were: Franklin Nelch, for three years; Fred Schumaker, Clarence Deal, and J. H. Rudolph, all for one year.

Short Course

Every year a series of short discussions and demonstrations pertaining to current operational problems confronting the ready mixed concrete industry are given at the Wabash

• Below: H. O. Wimsett and Stratton Cralle, both of the Ready Mixed Concrete Corp. of Indianapolis, demonstrated the aggregate moisture tester which their company has developed. The pitcher of water is not an integral part of the apparatus, but was used to wet the sample of sand about to be tested.

• Below, right: Ernest Horne, secretary; F. N. Bunzendahl; Charles O'Leary, president-elect; A. C. Modahl, last year's president.

Valley meeting. This pemmicanized critique of four years of engineering is known as the "Short Course."

Stanton Walker, director of engineering for the National Sand & Gravel and Ready Mixed Concrete Associations, spoke on *Specifications and Control for Ready Mixed Concrete.* Said Mr. Walker, the writing of A.S.T.M. specifications for ready-mixed concrete represented the most important contribution to the development of the industry. By drawing up these specifications, the A.S.T.M., in effect, stamped ready-mixed concrete as a recognized construction material. Today building codes in 44 states and the District of Columbia provide for the use of ready-mixed concrete and while the four remaining states are silent, they don't actually prohibit its use.

Producers, Mr. Walker said, should campaign against archaic building codes. One solution is to ask that the A.C.I.'s building codes be incorparated into the local regulations.

Mr. Walker believes that the strength test is a poor measurement for the determination of good concrete. One of his objections is that the test takes too long and that the concrete is in place long before the strength is determined.

• Hazel Darnell Propp paused a moment to allow us an opportunity to snap this picture. Mrs. Propp, one of the few women ready-mixed concrete operators, heads the Acme Ready Mix Concrete Company of Rockford, Illinois.

Stratton Cralle and H. O. Wimsett, both with the Ready Mixed Concrete Corp., Indianapolis, demonstrated the use of an aggregate moisture tester (see cut) which their company has developed. The same unit can also be used to determine the amount of air entrained in concrete. (For further details see PIT AND QUARRY, Nov., 1947.)

C. I. Bohmer, chief engineer, Jaeger Machine Co., led a discussion on new developments in transit mixers. In recent months, Mr. Bohmer said, most producers have mounted their mixers on tandem axles. This allows a larger mixer to be mounted on a given truck chassis without exceeding the allowable axle load. With more federal money going into municipal street construction, load limits are likely to be held within an 18,000-lb.-per-axle limit.

No report of the 6th annual meeting of the W.V.R.M.C.A. would be complete without some mention of the two fine motion pictures shown during this convention. One of the movies was called "Tilt-up Concrete Construction". It was prepared by the P.C.A. and concerns horizontally cast walls poured at the job site, and tilted into position. The other film showed moving pictures of the Terre Haute Concrete Supply Co. (See PIT AND QUARRY, September, 1947) operations. It was an excellent example of good institutional advertising.

Technical Sessions

(*Continued from page* 131)

emphasized that the most effective measures immediately at hand include the production of high quality units which meet A.S.T.M. specifications not only as to compressive strength but also as to limiting moisture content.

Building Costs John Strandberg Jr. advanced the opinion that concrete masonry homes, with poured floors and precast concrete joists, are fully as economical as those built with competitive materials. When maintenance over a period of years is taken into account, he added, the advantage clearly lies with the masonry home. Such lending institutions as F.H.A., the Veterans Administration and others, Mr. Strandberg said, recognize the superiority of concrete masonry homes by making higher evaluations than on comparable structures built with most competitive materials.

Plant Safety Ivan LeGore, Assistant Manager of the Portland Cement Association's Accident Prevention Bureau, spoke on the general problem of safety in industry, and reviewed some of the significant gains that have been made since the safety movement was launched 35 years ago. Pointing out that accident experience in the concrete masonry industry is ten times heavier than in the portland cement industry, Mr. LeGore urged block manufacturers to unify their safety programs under the sponsorship of N.C.M.A. Accidents, the speaker said, can no longer be regarded as glorified misfortunes, but are a clear indication of incompetence. Accident prevention, Mr. LeGore stated, is an integral part of production, requiring the same methods, training, direction and procedures.

Safety Program Cloyd Fellabaum, chairman of the N.C.M.A. Accident Prevention Committee, presented figures on the 1947 frequency and severity rates for 81 member plants. Against a frequency rate of 14.16 for all industries, the figure for reporting plants was 91, and in severity the block plants rated 2.7 against 1.28 for all industries.

In spite of the relatively small number of plants reporting, Mr. Fellabaum said, the figures clearly indicate an urgent need for an industry-wide safety program. He urged all block producers to maintain accurate accident statistics, and to cooperate with the association in improving safety conditions.

GENERAL SESSION

Apprentice Training Maurice M. Hanson, Assistant Director, Apprentice Training Service, Washington, D. C., outlined the progress made to date in the government's efforts to enroll 200,000 apprentices in the building trades. Incomplete figures, Mr. Hanson said, show 112,000 apprentices now in employment. Of this number, over 9,500 are bricklayer apprentices employed by 5,000 contractors.

Plan Service C. A. Sirrine (Loree & Sirrine, Architects, Ann Arbor, Mich.) outlined the important aspects of the association's plan service, calling attention to the 16 home designs which were on exhibit in the foyer throughout the convention. About March 15th, Mr. Sirrine said, a new portfolio featuring the designs will be ready for distribution through N.C.M.A. In addition to newspaper mats for advertising tie-ins, the new plan service will offer (for outright purchase or rental) scale models of the various designs for display purposes.

In urging member companies to take advantage of the expanded plan service, Mr. Sirrine pointed out that in the past, 3 sets of complete plans have been distributed to homebuilders for every 100 portfolios sent out. He stated that the homebuilders' market for concrete masonry is now almost universal, and that it is therefore largely up to the industry to develop and promote its product, employing such effective tools as the association's plan service.

Southern California Concrete Masonry Association Holds Winter Meeting

another ON THE SPOT report

SOUTHERN California bowed deeply to Michigan on the gridiron in the Rose Bowl, but it has taken over that Midwestern state's former undisputed position as the largest user of concrete blocks per capita.

This was revealed at the winter meeting of the Concrete Masonry Manufacturers' Assn. of Southern California in statistics presented by one of the speakers, Hugh Barnes, manager of the Los Angeles district office of the Portland Cement Assn. and rather ruefully corroborated by a distinguished guest, Ben Wilk, one of Detroit's leading concrete products manufacturers.

The meeting, held at the Rock-A-Way Inn in San Gabriel, Calif., on the evening of January 29, 1948, attracted nearly 100 concrete products men and other interested individuals who enjoyed a sumptuous steak dinner and heard some interesting facts about their industry.

Mr. Barnes presented figures to show that southern California's per capita use of concrete-masonry construction has risen to three times the national average; that the use of concrete building units in that area in 1947 was approximately 33 times what it was in 1937. He revealed that the Portland Concrete Assn. expenditures in the Los Angeles area to promote the use of concrete blocks runs uniformly about $30,000 annually.

A report from the association's public-relations counsel, Wm. R. Latta, gave preliminary results of a survey within the Los Angeles building industry with regard to its attitude and acceptance of concrete masonry construction. It was revealed that only 4 percent of the scores who were interviewed were unalterably opposed to concrete block construction; 22 percent actually prefer it to any other form of construction. The need for more sound, factual information on concrete masonry's advantages is apparent and the association is striving in that direction in its broad promotional program.

Albin Mackenzie, of the engineering firm of Mackenzie & Mackenzie, and the association's structural engineer pointed out some of the good

By HARRY F. UTLEY

and bad features of the new Los Angeles building code. He also urged that members cooperate in supplying data on early concrete masonry buildings and on multi-storied structures built with concrete units. Information and data, as well as photographs proving that concrete block has successfully resisted fire and earthquake, are especially desired for use in the forthcoming educational campaign.

Al Mills, who has been instrumental in the masonry-contractors' efforts to attract more bricklayers to the West Coast as well as to encourage an apprentice-training program, spoke of the results being attained. The acute shortage of these workers has been partly alleviated by assurances from hotel and apartment house owners that housing will be made available for bricklayers who come from the East and Middle West. Newspaper advertisements in cities east of the Rockies have resulted in the influx of several hundred bricklayers. A large number of apprentices, many of them ex-G.I.'s, are also receiving pre-job training in approved trade schools in Los Angeles, Mr. Mills reported.

J. A. Allen of the Hollostone Co., North Hollwood, served as chairman of the meeting. It was the first official gathering of the group for Cliff Hendrickson, new secretary-manager of the association.

• At the speaker's table: George Fosdyke, General Engineering Service Co.; Cliff Hendrickson, secretary-manager; J. A. Allen, newly elected president of the association; Hugh Barnes, Los Angeles district manager, Portland Cement Assn.; Ben Wilk, Detroit, Mich.; Albin MacKenzie, structural engineer.

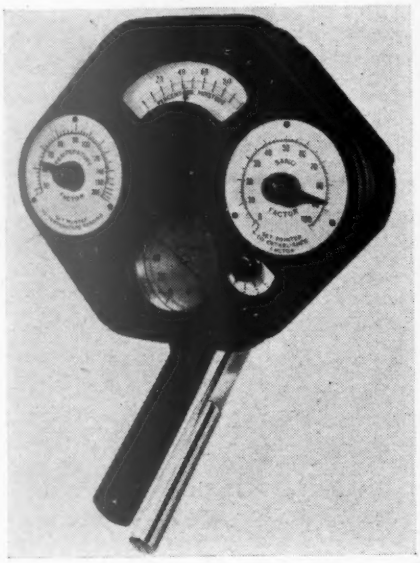
• Members of the Concrete Masonry Manufacturers Assn. of Southern California and their guests assemble for a dinner meeting in San Gabriel, Calif.

NEW MACHINERY and SUPPLIES

● Sand Moisture Meter

The 285 "Moistmeter" is a device which is inserted into sand for determining the moisture content of the material. The percentage of moisture is indicated on an easy-to-read dial. In this model all metering devices are housed in a strong light alloy casting, encircled with a rubber bumper.

Two arms forming a pair of tongs are mounted to the housing. The curved sampling plate is attached to the end of the fulcrumed arm. As the operator



releases this arm, the sand trapped within the plate is squeezed to a definite hardness against the stationary arm. Electrical power is furnished by a 22½-volt battery which should be discarded whenever it fails to give a reading of 10 on the dial. Since the amount of current used is very small, however, the battery need not be changed frequently. Harry W. Dietert Company, 9330 Roselawn Ave., Detroit 4, Michigan.

● Seal for Concrete Surfaces

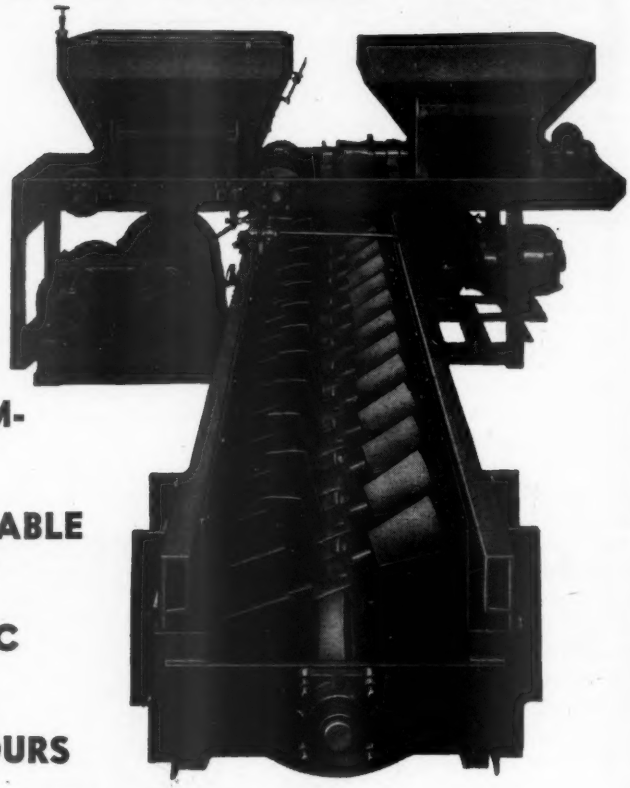
Sika Chemical Corporation of Passaic, N. J., has developed a protective coating called "Sika-Seal" which reportedly offers complete protection to concrete and masonry surfaces. Tests are said to have left dried Sika-Seal film unaffected by immersion in various acid and salt solutions.

It is described as "a black, tough, flexible, durable film" with "an affinity for dry or wet non-leaking surfaces." It is composed of blends of specially treated high-grade asphalts, plasticizing and adhesive compounds brought to the proper consistency with powerful solvents.

Sika-Seal is not affected by natural changes in temperature. Usually two coats are applied; and in special cases three may be needed.

New In Design this

KENT *Stediflo* **Continuous MIXER**



MIXES MORE THOR-OLY, FASTER, MORE ECONOM-ICALLY with a REMARKABLE SAVING in ELECTRIC POWER and MAN HOURS

Investigate These Advantages:

Specially Adapted for Large Plants it greatly reduces unit cost. *Accurate Volumetric Proportioning and Thorough Mixing* not exceeded by any other machine or method.

Continuous Belt Delivery of aggregate with remarkable smoothness and accuracy.

Continuous Delivery of Concrete in volume to produce upward to 1100—8 x 8 x 16 inch blocks or equivalent per hour. (Output variable to meet exact demands of block machine.)

Low Initial Cost as compared with machines of similar capacity that lack this machine's several advantages.

Low Labor Cost. Except for initial adjustment of output this machine requires only periodic inspection. (Manpower produces elsewhere.)

Low Power Cost as this machine requires only 7 H.P. as compared to 40 to 50 H.P. on machines of similar output.

Low Maintenance Cost as all main parts operate with exceptional smoothness and freedom from vibrations on pressure lubricated anti-friction bearings.

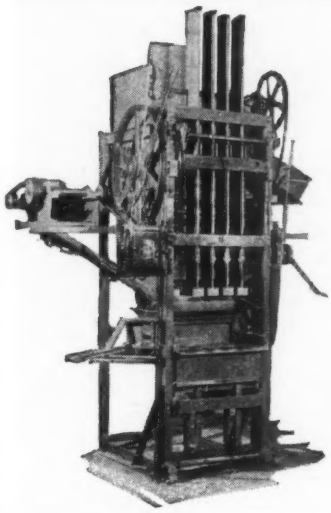
Available in RIGHT or LEFT Hand Units adaptable to your machine.

WRITE FOR ILLUSTRATED BULLETIN

The KENT MACHINE COMPANY

Manufacturers of CONCRETE PRODUCTS MACHINERY *Since 1925*

CUYAHOGA FALLS, OHIO, U.S.A.

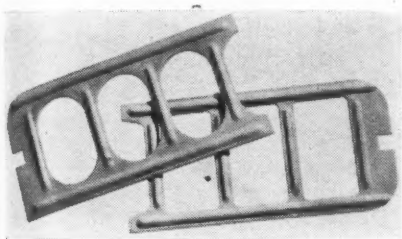


This concrete block machine is reported to be able to turn out four 8- by 8- by 16-inch blocks per minute. With a crew of three men, its performance runs to 1,500 to 1,600 units per day. The makers state that the Ford produces 30 types of block. Ford Cement Block Machine Company, Cedar Falls, Ia.

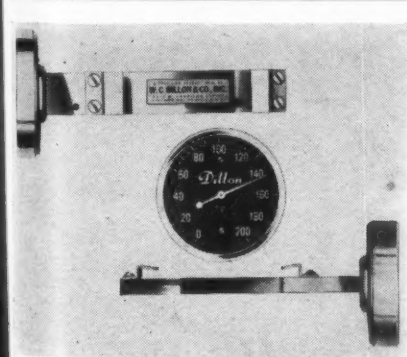
• Bull Nose Pallets

Close clearance steel pallets for rounded corner "bull nose" concrete blocks are now available for 7¾-in. or 8-in. width units.

Pallets designed for the individual unit

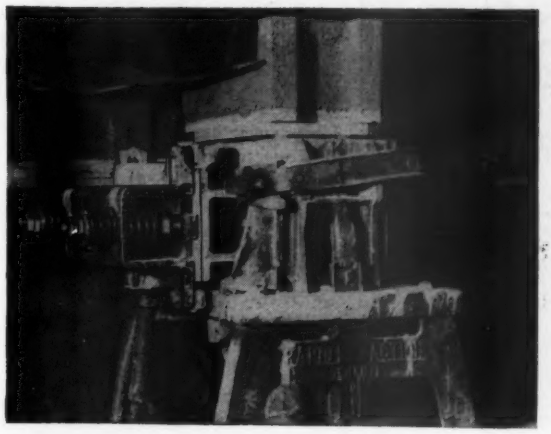


to be produced should enable the block manufacturer to make bull nose units at the same cost as standard square corner units. The Commercial Shearing & Stamping Co., Youngstown, Ohio.



This new thermometer, designed to clamp on flat surfaces, can be supplied in flat stems of varying widths, thicknesses and lengths. The stems are available in a wide range of metals. The following capacities are standard: 0-200 deg. F., 50-500 deg. F., 150-750 deg. F., and 200-100 deg. F. Three-inch and 5-inch dials are also standard. W. C. Dillon & Company, Inc., 5410 W. Harrison Street, Chicago 44, Illinois.

NOW YOU CAN ADD



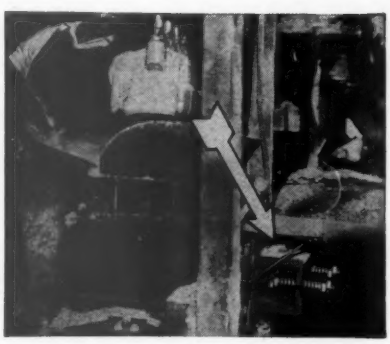
"Vibration"

To Your Hand or Power Block Machine with

SYNTRON

"Pulsating Magnet"

ELECTRIC VIBRATORS



3600 powerful, pulsating vibrations per minute will produce a denser, stronger block and improve its appearance.

Applied to either the mold box or the pallet depending upon the design of the machine.

The illustrations show a Model V-75 mounted on a hand machine — and a Model V-500 on a power machine.

Investigate their advantages, write to

SYNTRON CO.

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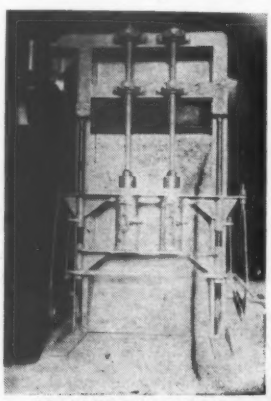


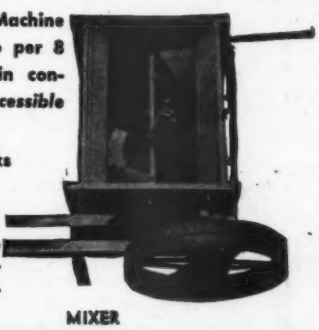
DRAIN TILE MACHINE

Write for Complete Information

HIGH PRODUCTION—LOW INVESTMENT

The Wooten Drain Tile Machine produces 2000 to 3000 tile per 8 hour shift. It is *rugged* in construction and *simple* and *accessible* in design. Price $685.00.

Delivery 2 to 5 Weeks



MIXER

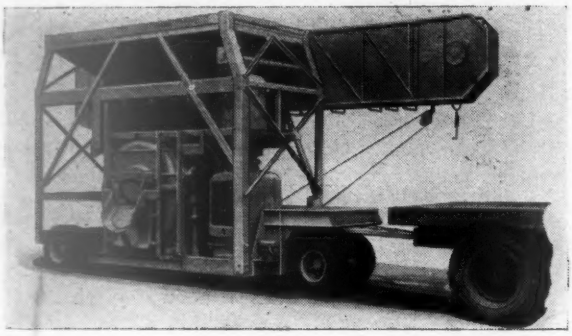
WOOTEN MIXERS

Sturdily Built in Any Size to Meet Your Production Requirements. 9 Cu. Ft. Mixer $375.

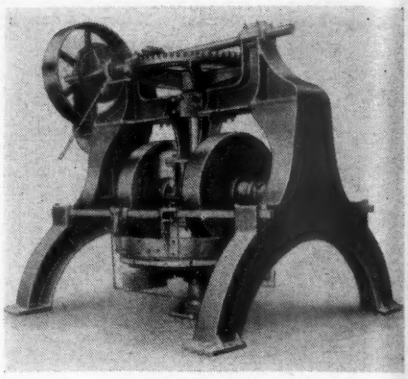
C. M. WOOTEN CO. • 2717 Central Ave. Knoxville, Tennessee

● Portable Concrete Plant

The Erie Steel Construction Company, Erie, Pa., offers its Strayer portable concrete plant in two sizes—20 to 30 cu. yds. per hr. and 30 to 40 cu. yd. per hr. Features cited by the manufacturer are as follows: a portable ramp and truck hopper; three-material bin of 20-cu.-yd. capacity; weighing "Aggremeter"; bag cement hopper with automatic screw feeder; oversize power unit; welded steel chassis on eight pneumatic tires; enclosed bucket elevator with swinging spout.



While in transit the bin sides fold in. All controls for the mixer, bin and aggregates gates are hydraulic. The concrete mixer has a 10 percent surcharge capacity. An auxiliary bucket hoist holds the complete batch, providing a high discharge level for loading buggies, dump trucks, chutes and floor hoppers.

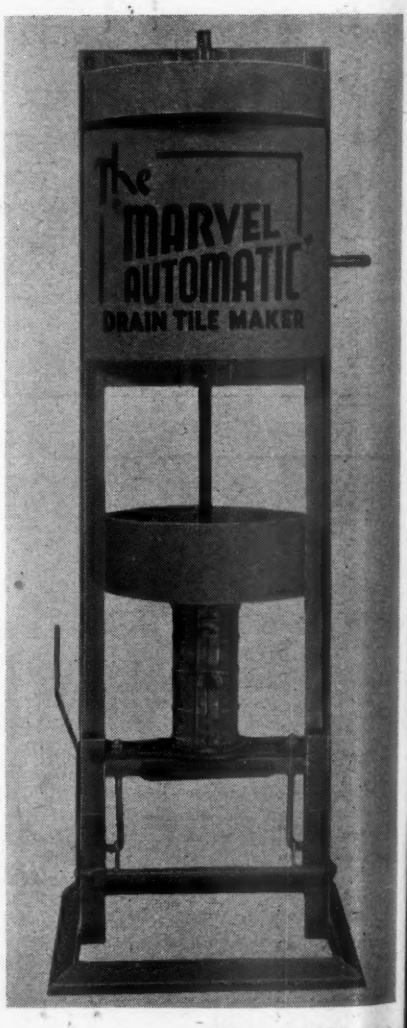


The No. 9 Clinker and cinder grinder, built by the W. A. Riddell Corporation, Bucyrus, O., is especially designed to produce aggregate at proper sizing. The suspended muller is adjustable to any height, or for finer grinding the grinding surfaces run together. Average capacity, 26 tons; speed of 48-in. clutch pulley, 150 r.p.m.

● Automatic Drain Tile Maker

Among the major products of the Concrete Machinery Company, Hickory, N. C., is the firm's "Marvel Automatic" drain tile maker, which produces 4-in. and 6-in. tile. Standard equipment includes one mold band and packer piston of each size. Additional parts are available if desired. One control arm operates the machine.

The company also manufactures molds for garden ornaments and furniture.



"DUMPCRETES PAY FOR THEMSELVES IN FOUR MONTHS"

That's the report from Indianapolis where the 10-million-dollar Windsor Village is going up in record time. Dumpcretes are pouring floor slabs, foundation walls and curb-and-gutter work with superior concrete.

Central-mix, air-entrained concrete is hauled 3½ miles in the low-cost, water-tight Dumpcrete. There is no segregation or bleeding, and the concrete is chuted right where needed and finished immediately.

Dumpcretes are doing a better job than truck mixers without the expense, and without idle time. The Monroe Corporation says, "Our concrete bodies are busy every day. When it is cold or wet, they haul sand and gravel."

Concrete men in 41 states are saving just like this with the Dumpcrete. You can too. Write today for 8-page booklet.

DUMPCRETE DIVISION
MAXON CONSTRUCTION CO., INC.
442 Talbott Bldg., Dayton 2, Ohio

The Dumpcrete Body

Lightweight, watertight, loads fast, dumps fast or slow, places anywhere, costs less to buy and run. Ideal for hauling aggregate, coal and earth.

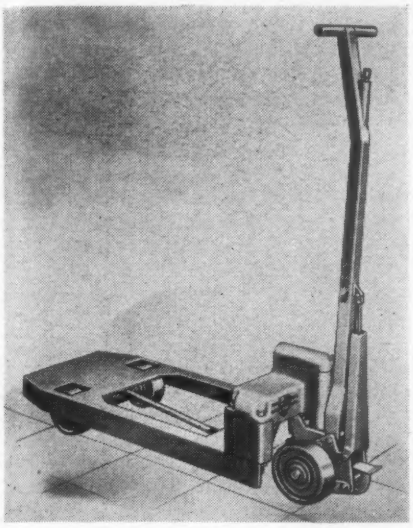
• • •

*** Dumpcrete Concrete**

Is central-mix air-entrained concrete hauled and placed with the speedy, low-cost Dumpcrete. Provides top-quality, plastic, workable and non-segregating concrete, saving up to $1.00 per yard.

● Single-Stroke Lift Truck

Features claimed for this new single-stroke truck include greater underclearance for negotiating ramps and



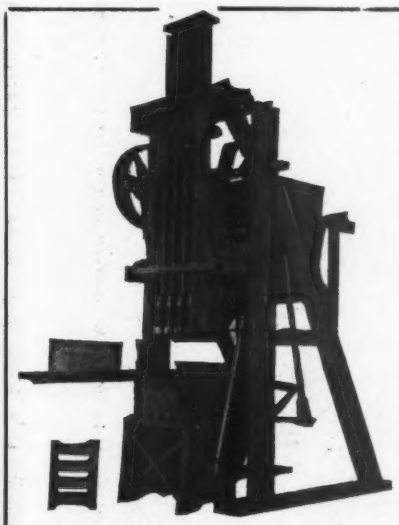
lightweight single frame design incorporating the use of heavy-gauge formed steel plate. Large 8-in.-diameter front wheels equipped with Timken roller bearings are supplied on all models to insure easy rolling.

Other desirable features offered include a 180-degree operating radius, push-button action to engage the lifting device, a safety lock on the handle to prevent injury to the operator and a built-in hydraulic release check. Lyon-Raymond Corporation, 4502 Madison Street, Greene, New York.

● Variable Speed Control

Standard equipment on the 1948 "Scoopmobile" is a new reversing and reduction gear box, according to announcement from Mixermobile Distributors, Inc. The latest improvement to the Scoopmobile has provided additional gear reduction of 3.01 to 1 forward and 2.5 to 1 reverse.

Flexibility of the machine has been increased by means of the new gear box, which permits the pre-selection of four operating speeds in either direction, and the reduction of forward speed to less than 100 feet per minute. This latter factor permits the synchronization of forward travel with the speed of the closing action of the bucket.



An All-Purpose Machine

The Junior Stripper will turn out more blocks per man than any other hand-operated machine on the market . . . 200 per hour being easily maintained! Nor has quality of output been sacrificed for the sake of speed. Units are uniformly dense, true to shape, of uniform texture.

Stearns Clipper Stripper Machines; Stearns Joltcrete Machines; Stearns Mixers; Cast iron and press steel pallets. Straublox oscillating attachments, etc. Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager — Columbus, Ohio

The new **BARTILE ROOFING MACHINE**

It's Different.....It's Sensational

● The wildest storm or heaviest gale won't budge an interlocking BARTILE concrete tile roof. Light in weight, BARTILE is priced competitively with ordinary short-lived combustible roofing. Colorful, streamlined BARTILE roofing cannot warp, rot nor decay. And fireproof, waterproof, sunproof BARTILE actually improves with age!

● Like the tile it produces, the BARTILE Roofing Machine is built to endure. Its sturdy construction and easy, trouble-free operation assure you years of speedy, profitable BARTILE production.

● The BARTILE Roofing Machine is so simple to operate that one unskilled worker, after a few days training, can turn out up to 150 perfect roofing tiles per hour. Many large operators are using up to eight machines on a production-line basis for higher, economical output.

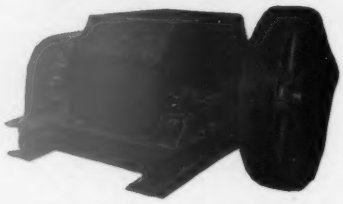
● Each BARTILE machine is sturdily engineered and carefully designed to assure long life. Low in first cost, its built-in ruggedness keeps maintenance expense low. Uniformly high-strength tile assured by positive electric-motor vibration. Precision-made steel pallets make accurate units that lay up perfectly.

BARTILE double tongue-and-groove tile interlocks perfectly. Lays up rapidly . . . requires no nails.

Get complete details NOW about this revolutionary machine that has a high pay-off for the low initial investment. Don't delay . . . write today while franchises are still available.

E. P. BARBER CO.
900 West Valley Blvd.
Bloomington, California

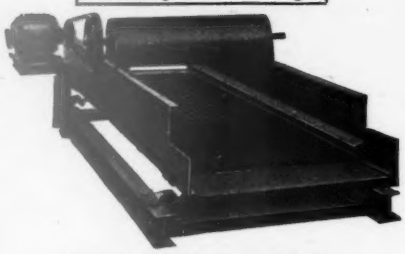
CINDER CRUSHERS FOR BLOCK MAKERS



10 to 20 ton per hour capacity **$474**

25 to 50 ton per hour capacity **$1074**

Prompt Delivery



VIBRATING SCREENS

For almost any type of screening operation, wet or dry. Makes your product more uniform and of higher quality.

BONDED SCALE CO.

129 Bellview Avenue
Columbus 7, Ohio

Manufacturers of Scales, Crushers, Conveyors and Vibrating Screens

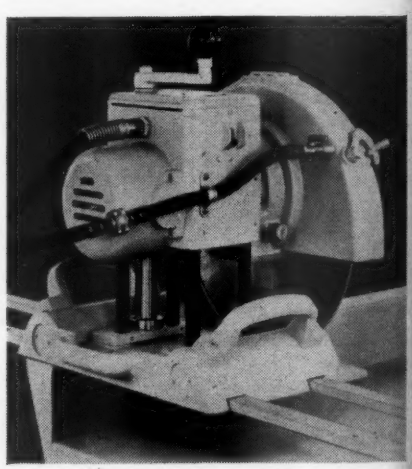
● Masonry Waterproofing

A new substance called "Agraseal" has been perfected by Tamms Silica Company, 228 N. La Salle St., Chicago, which is designed to do a protective and sealing job on all porous masonry surfaces and also beautify such surfaces. It is available in white, ivory cream, light buff, natural stone grey, sunny yellow and light green. A second coat is needed only for stronger color value or a smoother finish.

Agraseal is easily applied with an ordinary scrub brush. When first applied, the material penetrates deep into open pores. When it sets, a positive seal is established which is said to withstand dampness, water, steam, alkali, sun, smoke, heat, cold, frost and ice. Agraseal is sold only through block manufacturers. It comes in powder form and mixes with water only. One gallon covers 50 square feet for the first coat, 100 to 150 square feet for the second.

● Portable Saw

A new answer to on-the-job cutting problems is the Stone "Blue Streak" portable electric saw. This powerful, portable electric guided saw cuts wet or dry using either a diamond or an abrasive wheel. Its capabilities include cutting granite up to 5 inches in depth at 4 seconds per sq. in. and up to 10-ft. lengths with a 14-in. wheel.



The Blue Streak has 5-point suspension at strain points for balance and proper weight distribution. In this way, torque is said to be held at the minimum, with material and wheel breakage virtually eliminated.

The saw is available with standard rails 4 and 6 feet in length or with clamping rails from 6 to 10 ft. in length. A 2½-hp. glass insulated motor powers the unit, operating on 110 universal or 200 single phase under various loads at 2200 to 2800 r.p.m. Manufactured by the Stone Machinery, Inc., Syracuse, N. Y.

300
QUALITY BLOCKS PER HOUR WITH THE GRAVELEY
BETTER-BUILT CORONA BLOCK MACHINE

● Sturdy
● Efficient
● Adaptable

There is one in operation near you . . . see it . . . before you buy.

OTHER GRAVELEY MACHINERY

- Four other complete plants, 125 to 800 blocks per hour.
- Concrete Mixers—6 to 28 cu. ft. capacities—or larger to your specifications.
- Hoppers • Conveyors • Lift Trucks
- Racks • Pallets • Racking Hoists

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